News of the Industry Begins Page 424

SEP 23 1929

AUTOMOTIVE INDUSTRIES

Volume 61
Number 12

PUBLISHED WEEKLY AT CHESTNUT AND 56TH STREETS
PHILADELPHIA, SEPTEMBER 21, 1929

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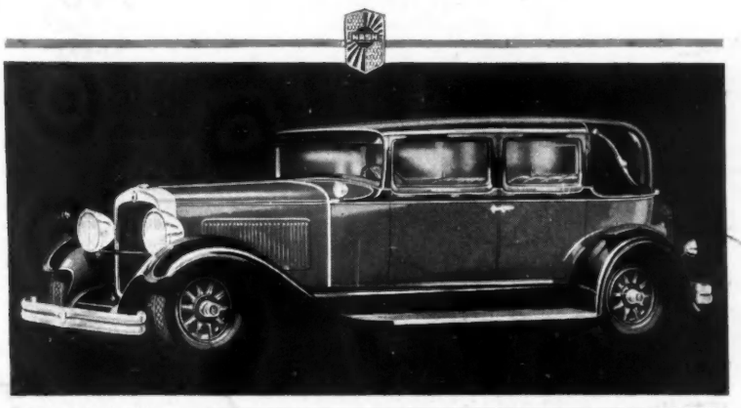

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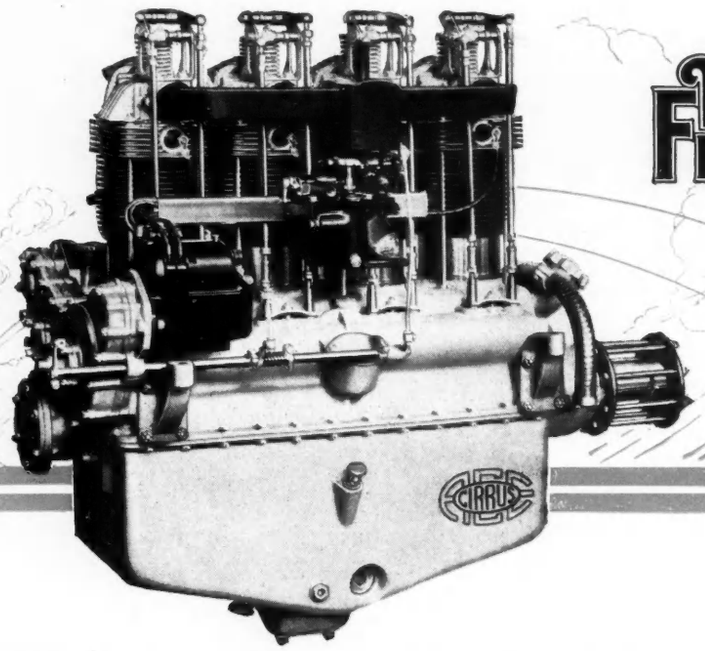

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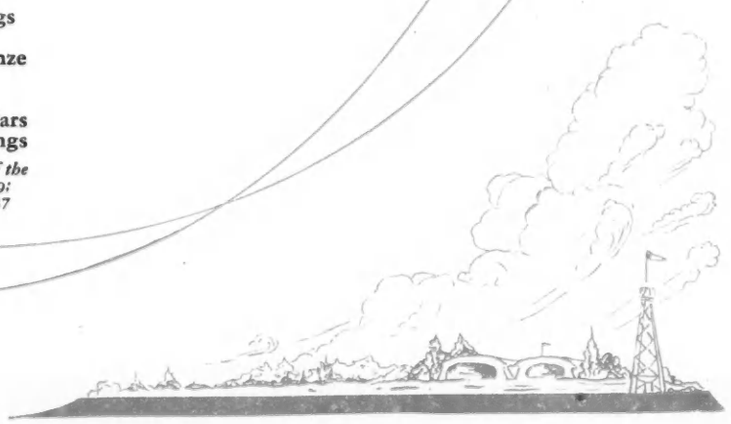

AUTOMOTIVE INDUSTRIES
AUTOMOBILE

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Established 1902

Vol. 61 No. 12

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Automotive Industries is published every Saturday by
CHILTON CLASS JOURNAL COMPANY
Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager
J. S. HILDRETH, Vice-Pres. and Director of Sales
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Controlled by United Business Publishers Inc., 239 West 39th Street, New York; ANDREW C. PEARSON, Chairman, Board of Directors; FRITZ J. FRANK, President; C. A. MUSSELMAN, Vice-President; F. C. STEVENS, Treasurer.

SUBSCRIPTION RATES: United States, Mexico, United States Possessions, Canada and all countries in Postal Union, $3.00 per year; Foreign, $6.00 per year Single Copies 35c.

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Automotive Industries — The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.

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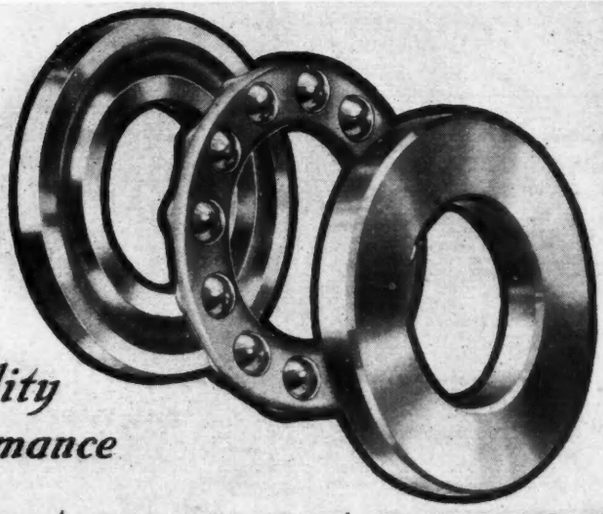

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AUTOMOTIVE INDUSTRIES

VOLUME 61 *Philadelphia, Saturday, September 21, 1929* NUMBER 12

Metallurgists and Motor Industry Linked Closer by *Metal Congress*

Annual assemblies of five metallographic groups and the Eleventh National Metal Exposition held in Cleveland last week attracted automobile executives in numbers.

By EARL O. EWAN

FURTHER recognition of the automotive industry as a user of metals and a stimulator of progressive metallography was accorded officially and generally in Cleveland last week at the Eleventh Annual National Metal Exposition and National Metal Congress. The formal cognizance came with the nomination of John M. Watson, metallurgical engineer of the Hupp Motor Car Corp., for the post of vice-president of the American Society for Steel Treating, under whose auspices the exposition and congress were held. This is the highest position in that organization for which a man primarily concerned with the manufacturing of automobiles ever has been nominated, which also implies that on Jan. 1, 1931, the society may be headed by a man from the automobile industry.

Such an acknowledgment seems only logical, however, when one recalls that the automotive industry consumes annually 78 per cent of all alloy and special steels, 25 per cent of all aluminum, 28 per cent of all nickel, to say nothing of 42 per cent of the machine tools of all types. Also when it is remembered that the industry is a major market for gas and electric ovens and furnaces, pyrometric equipment, metallurgical apparatus, foundry equipment, machine and small tools equipment for welding, forging, carburizing, electroplating and for material handling, as well as for abrasives, refractories and plant supplies.

Mr. Watson has been treasurer of the society for the last two years and will continue to hold that office until Jan. 1, 1930. Moreover, Mr. Watson is a charter member of the American Society for Steel Treating and was chairman of the Detroit chapter in 1924. In addition, he has written several authoritative articles on engineering and chemistry and has delivered addresses on those subjects. His "Practical Aspects of Metallurgical Work" was presented at the Detroit convention of the society in 1922, and his paper on "Heat Treatment of Automotive Parts" was read before the Boston gathering in 1924. For several years Mr. Watson has been chairman of the iron and steel division of the Society of Automotive Engineers, of which he is a member. At the meeting of that organization in Detroit in 1927 he delivered an address on "The Relation of the Metallurgical Department to Production." In addition to his work for Hupp, Mr. Watson is a consultant in metallurgy for the Detroit Gear & Machine Co. of Detroit.

John M. Watson, metallurgical engineer of the Hupp Motor Car Corporation, who has been nominated for the vice-presidency of the American Society for Steel Treating, the highest post in that organization for which a man in the automotive industry ever has been considered

Other nominations announced for offices in the American Society for Steel Treating were: For president, Robert G. Guthrie, now vice-president of the society, to succeed Zay Jeffries; treasurer, A. L. Fulton, president, Wheelock, Lovejoy & Co., Inc., Cambridge, Mass., and for directors, W. B. Coleman, president, W. B. Coleman Co., Philadelphia, and O. E. Harder, professor of metallography, University of Minnesota, Minneapolis. Mr. Guthrie and Mr. Watson have been nominated for one-year terms, and Mr. Fulton, Mr. Coleman and Mr. Harder for two-year terms. Inasmuch as only one candidate is named for each office, nomination virtually insures election. A ballot will be taken by mail in November, and the new officers will assume their stations on Jan. 1, 1930.

Widespread evidence of the new perception of the automotive industry relative to metallography was found in the papers read before the five groups convened at the congress, of which 38 manuscripts were presented before the American Society for

Steel Treating, and in the general conversation of the 6000 men and women from outside Cleveland who registered for the congress.

Among the numerous papers read before the eleventh annual convention of the American Society for Steel Treating, the fall meeting of the Institute of Metals Divisions and Iron and Steel Divisions of the American Institute of Mining and Metallurgical Engineers, the fall meeting of the American Welding Society, and the fall meeting of the Iron and Steel Division of the American Society of Mechanical Engineers were the following, abstracts of most of which will be found elsewhere in this issue:

"The Selection of Case-Hardening Steels for Highly Stressed Gears," by H. W. McQuaid and O. W. McMullen of the Timken-Detroit Axle Co.; "The Economical Re-Use of Solid Carburizing Materials," by H. B. Knowlton, the International Harvester Co.; "The Dilatation of Steel During Quenching," by G. M. Eaton, Molybdenum Corp. of America; "Methods of Tests for Determining the Machinability of Metals in General, With Results," by O. W. Boston, director of engineering shops, University of Michigan; "High Strength Cast Iron," by E. J. Lowry, consulting metallurgist, Detroit; "Hot Aqueous Solutions for the Quenching of Steels," by H. J. French, International Nickel Co., and T. E. Hamill, U. S. Bureau of Standards; "Study of Nitride Needles," by P. Alexander, General Electric Co.; "How to Test Welds," by F. G. Tatnall, Southwark Foundry & Machine Co.; "Chemical Reactions of the Carbon Arc," by G. E. Doan and E. Ekholm, Lehigh University; "Non-Destructive Testing of Welds With the Stethoscope and X-Ray," by C. O. Burgess, A. B. Kinzel and A. R. Lytle, Union Carbide and Carbon Research Laboratories, Inc.; "Radiography as a Tool in the Metal Industry," by W. L. Fink and R. S. Archer, Aluminum Co. of America; "Automatic Arc Welding of Thin Sheets," by W. L. Warner, General Electric Co.; "The Effect on Design of the Use of Welding in the Manufacture of Electric Machinery," by H. G. Reist, General Electric Co.; "Cutting and Welding Steel Parts to Replace Castings," by W. F. Buchanan, Bessemer Gas Engine Co.; "Reclaiming Non-Ferrous Scrap Metals at Manufacturing Plants," by F. N. Flynn, metallurgist, Milwaukee; "Oil-Electric Locomotives in Steel Mill Transportation," by W. L. Garrison, Ingersoll-Rand Co., and "Non-Destructive Testing," by Elmer A. Sperry, Sperry Development Co., Inc.

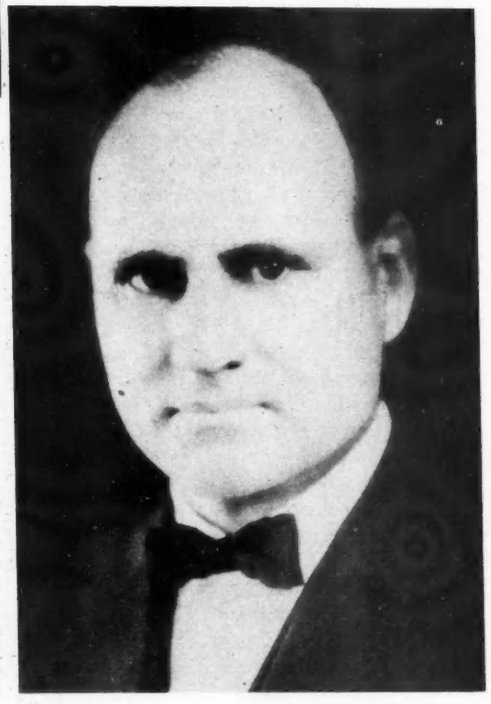
One of the most largely attended sessions of the congress was that of the American Society for Steel Treating held on the morning of Sept. 11 when Dr. Albert Sauveur, Gordon McKay professor of metallurgy at Harvard University, delivered the Edward De Mille Campbell memorial lecture. His topic was "Steel at Elevated Temperatures." The lecture was based on uncompleted research work being conducted in the laboratory of Harvard University.

The work described by Dr. Sauveur concerned tests of steel specimens. In each instance, one end of the specimen was secured to the furnace wall, while the other projected outside so that a twisting moment could be applied. The torsional strength, torsional distortion (number of twists before rupture) and torsional elasticity (stress/strain) thus were determined for a great many different steels over a wide temperature range. The results were presented in the form of charts or graphs projected on a screen.

Robert G. Guthrie, chief metallurgist of the People's Gas, Light & Coke Company, of Chicago, who has been nominated for the presidency of the American Society for Steel Treating. His term as vice-president of the organization will expire December 31, 1929

Another feature of the week was the annual banquet of the American Society for Steel Treating, held the evening of Sept. 12 in the Hotel Cleveland. Upon that occasion Thomas A. Edison was made an honorary member of the society. The inventor was unable to be present because of his recent illness, but a letter from him expressing his acceptance of the honor was read by William H. Eisenman, secretary of the society and general manager of the Eleventh Annual National Metal Exposition.

Of particular interest to automotive men was the paper entitled "The Use of Non-Ferrous Metals in the Electroplating Industry," which was read at the joint dinner of the Institute of Metals and the Iron and Steel Division of the American Institute of Mining and Metallurgical Engineers by Floyd T. Taylor, vice-president of the Hanson-Van Winkle-Munning Co.



Zay Jeffries, consulting metallurgical engineer for the Aluminum Company of America, Pittsburgh, whose term as president of the American Society for Steel Treating will expire December 31, 1929

"Electrodeposition has gained impetus since the World War for four distinct reasons," he said; "first, the utility of electrodeposition disclosed in the making of munitions, for example, the elimination of machine

gun barrel fouling when copper-plated bullets were substituted for the grease-coated varieties. Underweight shells were reclaimed by lead plating them internally. This method did not destroy the ballistic properties of the reclaimed shell, but it did save both time and money.

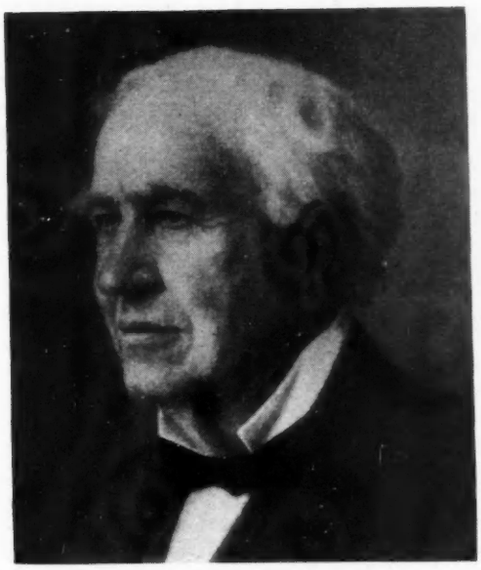
"Second, the development of labor eliminating, process stabilizing, electroplating machinery. Such machinery has freed the producer from the uncontrollable variables of manual production, lowered the cost and improved the quality of electrodeposited coatings.

"Third, in these days of high color combinations, bright electroplated coatings play a foremost part, and these days of high color combinations will probably exist until our entire mode of living is changed, because it has been demonstrated that color is an important stimulant to the nervous system, and that the bull is by no means the only animal that responds definitely to color sensations. Just as sugar forms an important fuel for the human engine, so do high colors and high reflecting surfaces form the stimulus to the nervous system which controls and directs the energies of the mind and body. Sales executives are recognizing the value of appearance as a sales appeal and highly buffed electroplated surfaces have never been equaled for such effects.

"The fourth reason is less obvious, but none the less real, and it is that the investment cost of modern electroplating installations has made it necessary in most plants to seek appropriations for the equipments from the higher officials of corporations. Thus such officials have become interested in the possibilities and advantages of electroplating. Their interest has been a stimulus to the operating staffs. When the tops are watching, the underneaths are doing.

"When nickel is deposited properly and to a sufficient thickness, all of which fortunately happens to be easy to accomplish, its protective value to the base metal lying underneath it is better than is generally recognized.

"Nickel forms the ideal coating under ornamental chromium plating and it is doubtful if chromium plating will ever be commercially successful for such purposes unless it is deposited over a satisfactory coating of nickel.



Thomas A. Edison, who became an honorary member of the American Society for Steel Treating at the National Metal Congress in Cleveland last week. Mr. Edison accepted the membership by letter, being unable to be present upon the occasion because of his recent illness

Albert Sauveur, Gordon McKay professor of metallurgy at Harvard University, and 1929 Campbell lecturer of the American Society for Steel Treating

"Nickel plating now takes annually about 2000 to 3000 tons of metal.

"An idea of the area of metal covered by nickel can be obtained when it is remembered that the average commercial nickel plate is approximately .0001 in. thick. This means that every ton of nickel deposited covers approximately 433,500 sq. ft. of surface.

"The mere mention of chromium suggests electrodeposition. The inherent advantages of chromium coating for high luster, for resistance to atmospheric tarnish, and for resistance to abrasion have focused an amount of attention on electroplating far exceeding any degree of interest previously shown in electroplating. This interest has resulted in the betterment of the whole art of electrodeposition.

"It is significant to call attention to the fact that the use of chromium plating is very new. Certainly in this country it dates from the World War and did not exist commercially here prior to the war. However, as might be expected with any such rapid and spectacular development, the beginnings of commercial chromium plating have been marred by over-enthusiasm. For example, at the outset chromium plating was heralded as the long sought for and perfect answer to the problem of corrosion elimination. It soon became evident that thin deposits of chromium are, at the present status of chromium plating, exactly as porous as are thin deposits of any other metal. Lack of porosity in any character of coating applied for corrosion prevention is essential when such protection depends upon the exclusion of moisture from the base metal.

"The natural hardness of chromium gives it real value in resistance to abrasion, but chromium-plated articles are not protected by the chromium plating from impact, since these distortions are a function not of the chromium coating, but of the hardness and resistance to distortion of the base metal onto which the chromium is deposited. The establishment of this fact eliminated a host of misapplications of chromium plating.

"Satisfactory chromium plating is not especially difficult to do, nor to any degree impossible or uncommercial. The control required for good chromium plating is similar to the control required when good deposits of

(Continued on page 414)

National Machine Tool Buil Will Comprise Products

Technical phases of equipment con at sessions of the annual nation S. A. E. and shop practice

PREPARATIONS for the National Machine Tool Builders Exposition to be held in Cleveland Sept. 30 to Oct. 4 are about complete. Approximately 260 exhibits will be arranged at the show, where some 3000 persons representing the exhibiting companies will be in attendance. An advance registration of 12,000 persons connected with the machine tool using industries has been approximated by the National Machine Tool Builders Association, the organization directing the exhibition.

Simultaneously with the show will be held technical sessions of the Machine Shop Practice Division of the American Society of Mechanical Engineers, the annual national production meeting of the Society of Automotive Engineers and the Machine Tool Congress. All technical sessions will be held at the Hotel Cleveland.

The A.S.M.E. meeting will be held on Sept. 30 and Oct. 1. George T. Trundle, president, Trundle Engineering Co., will speak at the first session on "What Information Does the Machine Tool Buyer Need From a Salesman?" Dr. Zay Jeffries, consulting engineer, General Electric Co., will talk on "The Present Status of Cemented Tungsten Carbide Tools and Dies" at the second session.

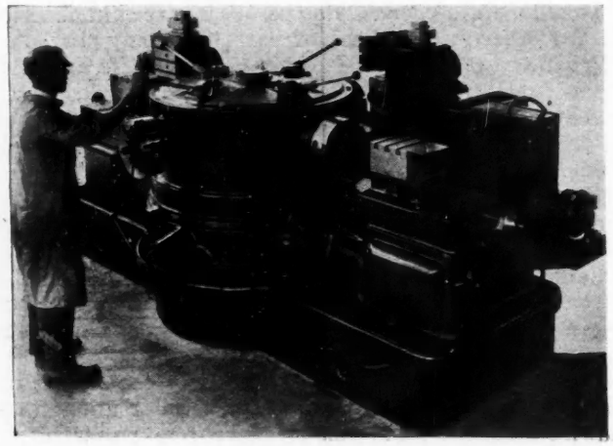
The sessions on Oct. 2 and 3 will be under the aus-

Multiple Spindle Chucking Machine

(Booth 1 B-3, West Annex)

A NEW development in work-rotating chucking machine is presented by the Goss & DeLeeuw Machine Co., New Britain, Conn. The new No. 6 G & DL machine represents a departure from the conventional design of work rotating chucking machines with multiple spindles.

The four horizontal work spindles are set radially 90 deg. apart in a horizontal turret and present the work to three sets of tools for simultaneous operation.



Goss & DeLeeuw No. 6 multiple spindle work-rotating chucking machine

The work spindles are driven by the main motor as shown in the illustration, and the mechanism is designed to transmit 25 hp. All four work spindles revolve simultaneously at the same speed. A two-to-one back gear furnishes a fast or slow speed for each combination of the quick change gears which are easily accessible. Spindle speeds from 16 to 525 r.p.m. can be obtained.

A 5 hp. motor furnishes the drive for the turret indexing and all the feeds on the main tool slides and cross slides. A third motor in the rear tool position is part of the special revolving tool spindle attachment.

This unit can be placed in any one or all of the three main tool slides, and is especially notable for the heavy spindle which is used. All three motors are connected to one control box and have push button control. The push buttons are located conveniently to each tool position so that the machine can be started, stopped or "jogged" from any position.

Threading, whether internal or external, is accomplished by the regular G & DL lead screw method with a reversing electric motor, and can be performed at any one of the three tool positions. Both inside and outside threads of different pitches can be cut simultaneously.

Both the main tool slides and the cross slides are actuated by solid barrel track cams. Both slides are

ders Exposition at Cleveland of 260 Manufacturers

struction and use will be discussed al production meeting of the division of the A. S. M. E.

pices of the S.A.E. On Oct. 2, Prof. F. E. Raymond, Massachusetts Institute of Technology, will read a paper on "Economical Production Quantities." On the evening of Oct. 3, there will be a general discussion of production, with the four topics of general interest outlined as "The Application of Standard Machine Tools to Automobile Manufacture," "Results in Production Due to New Features in Machine Tool Construction," "Synchronizing Automobile Parts at the Assembling End" and "The Basis of Replacing Machine Equipment." There will be no regular papers read at the meetings.

The Cleveland Sections of the Society of Automotive Engineers, Inc., and the American Society of Mechanical Engineers will act jointly as hosts for the Annual Production Dinner that will be held on the evening of Oct. 4 at the Hotel Cleveland. These affairs are strictly informal and have been notable in the past for their interesting speeches and recreational features.

In the following pages are described a number of newly developed machine tools, many of which will be exhibited at the exposition. Wherever possible, the booth number and location of the display has been included. An effort has been made to confine the descriptions to new tools, and space limitations have made it necessary to treat the material concisely.

---

exceptional in a multiple spindle machine because of their weight and size, and by means of combining the two motions heavy taper turning and forming cuts can be taken. The standard plain slide, as shown in the accompanying illustration on page 400, carries a heavy tool block with "T" slots on its upper face.

Improved Norton Grinders

(Booth 2 A-10, West Annex)

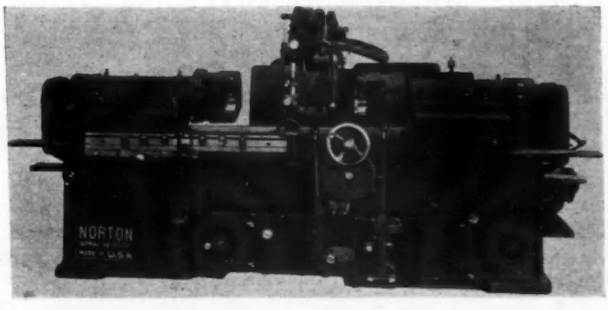
THE Norton Co., Worcester, Mass., will show a new double head crank pin grinding machine, illustrated herewith. The crank pin grinding machine is wholly new and has many features providing a maximum of safety to the operator and a minimum of manual effort in its operation. Operation of the work holders, table and wheel slide traverse are hydraulically controlled and by an interlocking device these mechanisms are made interdependent.

One cannot be moved while either of the others is in operation. For instance, when the clamps which hold the crankshaft are opened, neither the table nor the wheel slide can be moved with the hydraulic control. Similarly, the wheel slide and the work holder controls are inoperative while the table is in motion.

Another feature of the machine is the mechanical operation of the steadyrest. When unclamped from the table the steadyrest moves upward permitting easy access to the work. The upward motion of the steadyrest also stops the flow of lubricant, though this may be renewed if desired by a manual control. Attached to the steadyrest are splash guards and a Pratt gage, which also move in and out of operating position with the steadyrest.

The work holder spindles on the machine are synchronized and driven by two silent chains controlled by idler sprockets. The right-hand work head is stationary and the left is provided with a lateral adjustment to permit maintenance of the proper alignment of the crankshaft. Hydraulically operated clamps grip the work firmly. Failure of the hydraulic mechanism does not release the clamps, another safety feature. Locators on the work holders control the angular and endwise location of the pins in relation to a prescribed indexing position on the crankshaft.

A spacing bar and dogs, with positioning slots, locate



Norton double head crank pin grinding machine with hydraulically controlled work-holder, table and wheel slide traverse

the lengthwise position of the worktable for grinding each pin; and the machine may be set for a crankshaft with four, six or eight crank pins. Slow movement of the table is also provided for truing the grinding wheel. Four adjustments are provided on the wheel slide; fast motion to the shoulder of the pin, controllable feed down the shoulder to the body, fast return to the extreme rear position of the slide, and slow motion in both directions for truing to size the sides of the wheel to the correct width or thickness. Hand feed is employed while grinding to size.

Controls are centered in either side of the operator's position and are easily accessible. The machine is rigidly constructed and is entirely self-contained, a single motor mounted on the side of the rear base furnishing the motive power. It has a swing of 17 in. in diameter and is made in the following sizes: 24 in. to 30 in., 30 in. to 36 in., 36 in. to 42 in., 42 in. to 48 in., 48 in. to 54 in., 54 in. to 60 in.

They will also exhibit improved models of the Type A Cylindrical Grinder, the Type BA Cylindrical Grinding Machine and the Model 50 Crankshaft Lapping Machine. The Type A cylindrical grinder is now provided with hydraulic rapid wheel slide motion. The Type BA cylindrical grinding machine is now shown with hydraulic table traverse providing a wide range to table speeds. The new Type 50 crankshaft legging machine has several new features, chief of which is the mechanical elevating construction of the lapping arms. They are now counterbalanced and suspended from a vertical position.

Landis Grinders

(Booth 1 W-18, West Annex)

THE two machines described here are new additions to the line of Landis Tool Co., Waynesboro, Pa. The 5-in. Semi-Automatic Hydraulic Ball Race Grinder is designed for grinding internal or external raceways or face raceways for end thrust bearings. It is also adjustable for other forms of radial grinding.

Semi-automatic operation without complicated mechanisms is made possible through the use of hydraulic power for three machine movements, oscillating the work head; feeding the wheel head and traversing the wheel head slide.

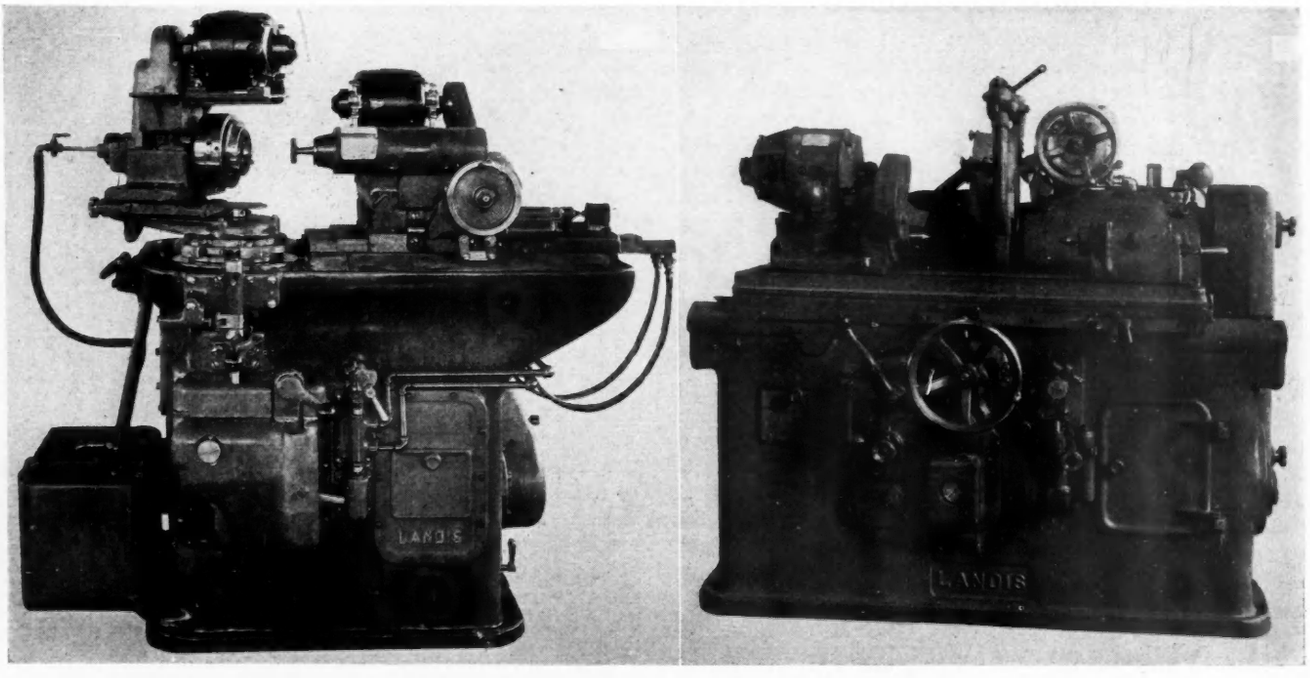
The operator merely loads the work and throws the main control lever. Work rotation, work head oscillation and wheel carriage traversal starts simultaneously. About the end of the wheel carriage movement, the wheel head starts to feed in rapidly, slowing down as the wheel nears the work and as the wheel comes in contact with the work the grinding speed is engaged.

From that point on the grinding feed controls the speed of the feeding in movement which ceases when the feed comes against a positive stop, indicating that the work has been ground to size. Throwing the main control lever in the opposite direction reverses all the movements, causing the wheel and work heads to return to their starting positions, at which point work rotation and work head oscillation automatically stop with the head in its back position. This facilitates changing the work. One operator can easily run two machines.

All electric motors are especially balanced and are attached to the machine. This in addition to the water tank being attached to the bed makes the machine entirely self-contained. The electrical equipment consists of three constant speeds, either AC or DC, motors and their controls. A magnetic starter with limit switch control is recommended for the work drive motor but a manual starter may be used for the other two motors.

The Landis 6-in. Type C Plain Hydraulic is a modern, high production grinder of great power, smoothness and flexibility. It is recommended for the rapid production of axle shafts, stub shafts, small shafting, small motor armatures and armature shafts, bearings, twist drills, valve faces, main camshaft bearings, side gears and other similar small parts. Especially is it adapted for the grinding of automotive pistons.

A distinctive feature is the hydraulic work carriage traversal with quickly available traversing speeds rang-

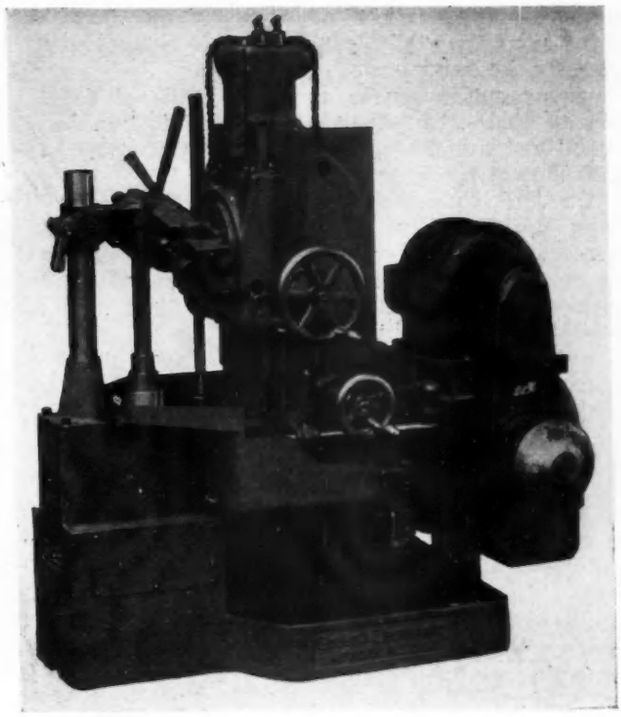


The Landis 5-in. semi-automatic hydraulic ball race grinder is shown to the left and the plain hydraulic No. 6 is at the right

ing from 12 in. to 360 in. per min. Quietness is insured by the end drive to the grinding wheel spindle through multiple V-belts. A 24-in. diameter grinding wheel brings the many large diameter wheel economies.

Great weight is properly distributed throughout the bed and the various mechanisms. As both electric motors are attached to the machine and the water tank is integral with the bed, a completely self-contained unit is the result. Hydraulic straight infeed to the grinding wheel head and a reciprocating wheel spindle mechanism may be supplied for plunge cut grinding. The work carriage traverses on a V and a flat guide with chilled surfaces thoroughly protected and spaced to give solid support. Tarry, which is adjustable, is regulated by a needle valve. The usual method of swiveling is utilized.

The main drive motor is mounted on the rear of the bed with the pulley directly in line with the wheel spindle pulley. A multiple V belt with gravity idler conveys the power to the grinding wheel spindle, traversing oil pump and water pump.



Above is the small universal gear hobbing machine, Model 9-H, to be shown by Gould & Eberhardt

Three New G & E Machines

(Booth 1 B-6, West Annex)

GOULD & EBERHARDT of Newark, N. J., have added to their line the three new machines described herewith.

The heavy 48-HS and 48-HL machines (Fig. 1) are particularly adapted for the roughing and finishing of large diameter and medium pitch spur gears, limited angle helical gears, sprockets and worm wheels used in tractors, railway cars, trucks, printing presses, mining and hoisting equipment, etc.

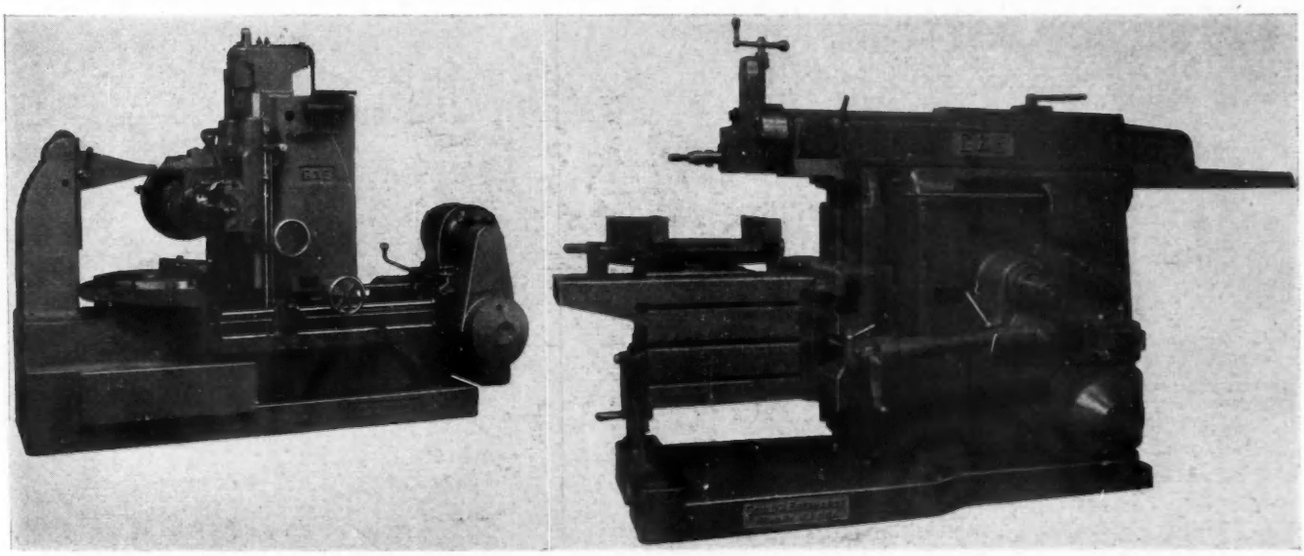
Rated for 2 D.P. in steel, the machines have a capacity up to 32 in. diameter with the arbor support and 57 in. diameter with support removed. Weight of machines is approximately 14,000 lb.

Characteristic of the manufacturing type hobbing machines, the cutter and work drives of the new 48-HS and 48-HL are balanced in this case with eight gears in each train from a common source terminating in a worm and worm wheel. The balanced drive insures uniform rotation between the cutter and work spindle.

Power rapid traverse at 50 in. per minute moves the cutter rapidly in either direction, and may be operated when the sork and cutter spindles are idle or rotating. The traverse and feed controls are interlocked, so that one cannot be set in motion until the other is disconnected. An adjustable cam to stop rapid approach, and safety pin prevents accidental downward operation of the power traverse. Adjustable stops govern the movement of feed and traverse, and fixed safety stops control extreme limits of motion.

The cutter slide is mounted on a rigid box section stanchion and travels on double rectangular guides, provided with independent adjustments. The stanchion is adjustable along the bed for depth of tooth and diameter of gear to be cut.

A 10-deg. angular adjustment of the cutter slide is provided for single, double or triple thread hobs. To



The machine to the left shows the 48-HS and 48-HL gear hobber added to the line of Gould & Eberhardt of Newark, N. J. At the right is the 36-in. manufacturing type shaper

utilize the full length of hobs, a positioning device shifts hobs axially to additional cutting positions without removing the hob.

Motor application is a direct connected drive and can be made with either belt or silent chain. Constant speed motor of 10 to 15 hp., 1200 r.p.m., either AC or DC current, is recommended.

The 9-H Universal Manufacturing Type Gear Hobbing Machine (Fig. 3) is particularly adapted for accurately generating spur, helical, herringbone and worm gears, used in photo-phone apparatus, navigation instruments, aeroplanes, automobiles, and other machinery requiring high quality gears of fine pitch.

This machine has capacity to cut gears up to 9 in. diameter with the arbor support, and 12 in. diameter with the support removed and is rated for 10 DP in steel. Weight is, approximately, 2800 lb.

The vertical cutting principle is embodied and the cutter slide is mounted on rectangular guides of the rigid box section stanchion that is adjustable for depth and diameter of gears to be cut. The cutter slide is swivelable through any angle of 180 deg. for cutting either right or left-hand helical gears of any angle. Cutter arbor is portable to permit using arbors of different diameters, and particularly to accommodate small diameter, solid shank hobs.

The work table is fixedly located and mounted on antifriction bearings directly in the base casting and rigidly supports the sork. The indexing worm is hardened and accurately ground, and engages with a cast iron chilled wheel.

The work arbor support is of the single post type with an adjustable arm that can be locked in any position.

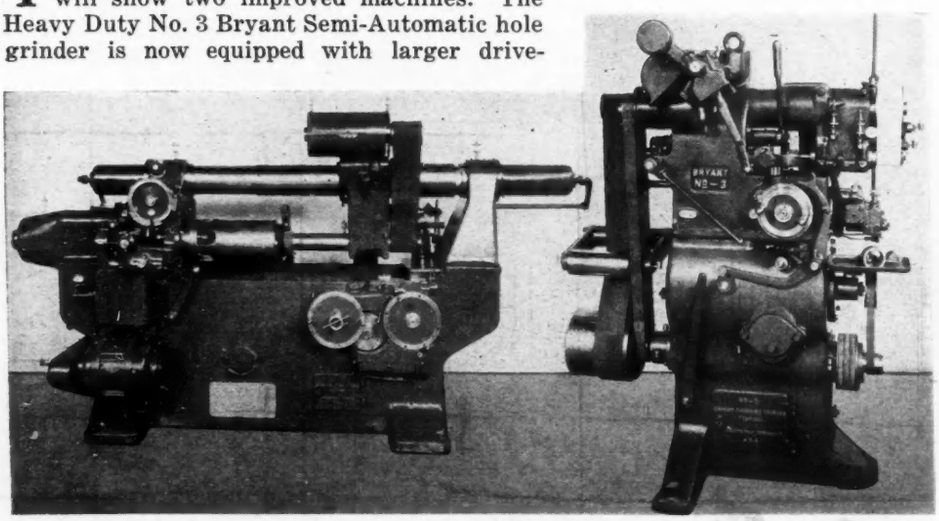
Motor application is a direct connected drive, and can be made with either belt or silent chain. Constant speed motor of 3 hp., 1200 r.p.m., either AC or DC current is recommended.

Fig. 2 shows a 36-in. Manufacturing Type Shaper. This new 36-in. shaper embodies the same appointments and features found in the 24-in., 28-in. and 32-in. Manufacturing Shapers introduced some time ago.

Improved Bryant Grinders

(Booth 2 B-12, West Annex)

THE Bryant Chucking Grinder Co., Springfield, Vt., will show two improved machines. The Heavy Duty No. 3 Bryant Semi-Automatic hole grinder is now equipped with larger driveshafts, wider belts, larger motor with texrope drive, has a greatly increased grinding range and shows similar advantage of high production in the finishing of large holes as it formerly gave in the grinding of small holes. The Bryant No. 24 Deep Hole Grinder is a heavy duty machine designed for high production of long and large bores. This machine is provided with hydraulic control and automatic sizing features.

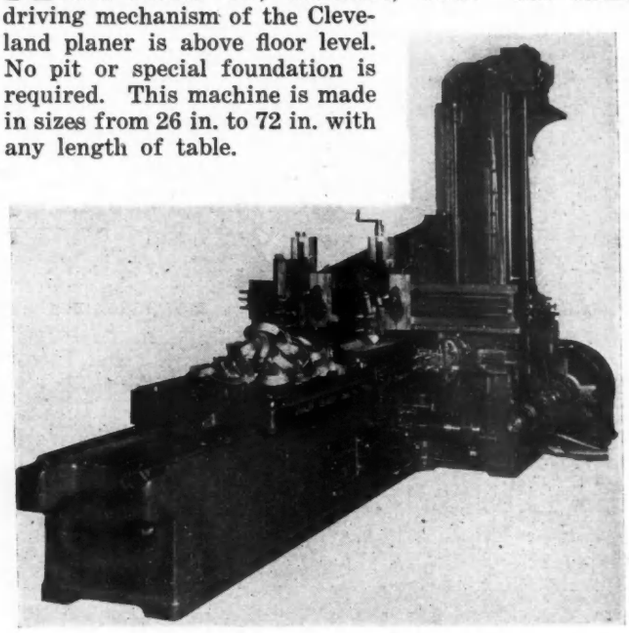


Bryant No. 24 deep hole grinder is shown to the left in the above picture. No. 3 semi-automatic grinder is at the right

Open Side Planer

(Booth 1 C-3, West Annex)

A NEW open side planer will be shown by the Cleveland Planer Co., Cleveland, Ohio. The entire driving mechanism of the Cleveland planer is above floor level. No pit or special foundation is required. This machine is made in sizes from 26 in. to 72 in. with any length of table.



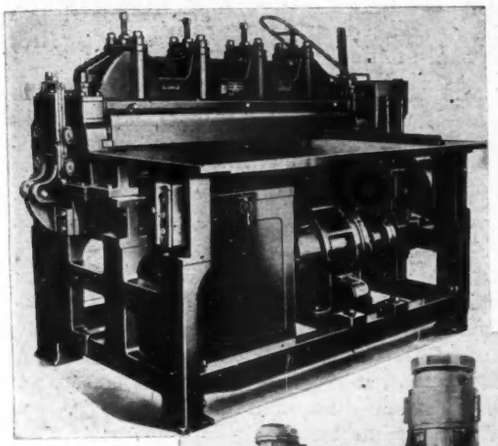
Cleveland open side planer

New Putnam Machines

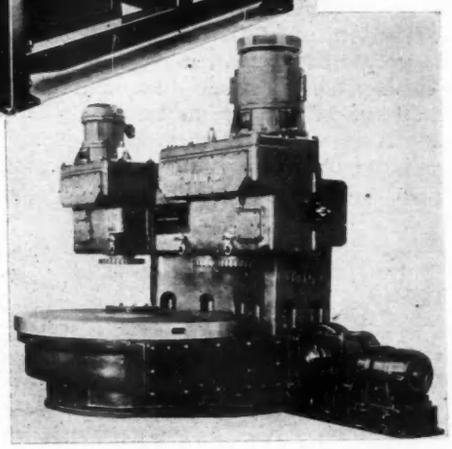
(Booth 2 B-5, West Annex)

TWO new Putnam Machines will be exhibited by Manning, Maxwell & Moore, Inc. The Putnam Type "K" rotary gang slitting machine is built in three sizes. The light machine is classed as the "B" type, the medium sized machine as the "F" type and the heavy machine as the "K" type.

These machines are arranged with the cutter frames interposed between two sets of feed rolls. The cutter frame carries the two cutter shafts and is arranged to swing out from between the rolls to give accessibility in setting up and adjusting the cutters. There are two types of cut-



Putnam Type K Gang Slitter is shown to the left



At the right is a Putnam 72 miller

ter frames, the solid cutter frame, which is standard equipment, and the adjustable cutter frame, which is extra equipment.

The solid cutter frame is designed only for the chair type cutters, these cutters being fitted to, and supported in, chair-shaped bearings. With this type of cutter, the cutter shaft does not support the cutters, but functions only as a driver. The chair bearings that carry the cutters are rigidly clamped to the cutter frame. The cutter frame is fitted to the bed and clamped in that position from above by means of a "strong-back" between the uprights of the main frame.

The intake and discharge rolls are provided with adjustments by which the rolls may be set apart slightly less than the approximate thickness of the stock to be cut. The rolls exert sufficient pressure to feed the stock.

These machines may be arranged with a belt drive or a self-contained motor drive. The motor may be either constant or variable speed with push button control, start, stop and reverse. If it is desired to cut stock with a length greater than five feet a special loading table may be furnished to accommodate such lengths.

Automatic Chucking Machine

(Booth 2 C-2, West Annex)

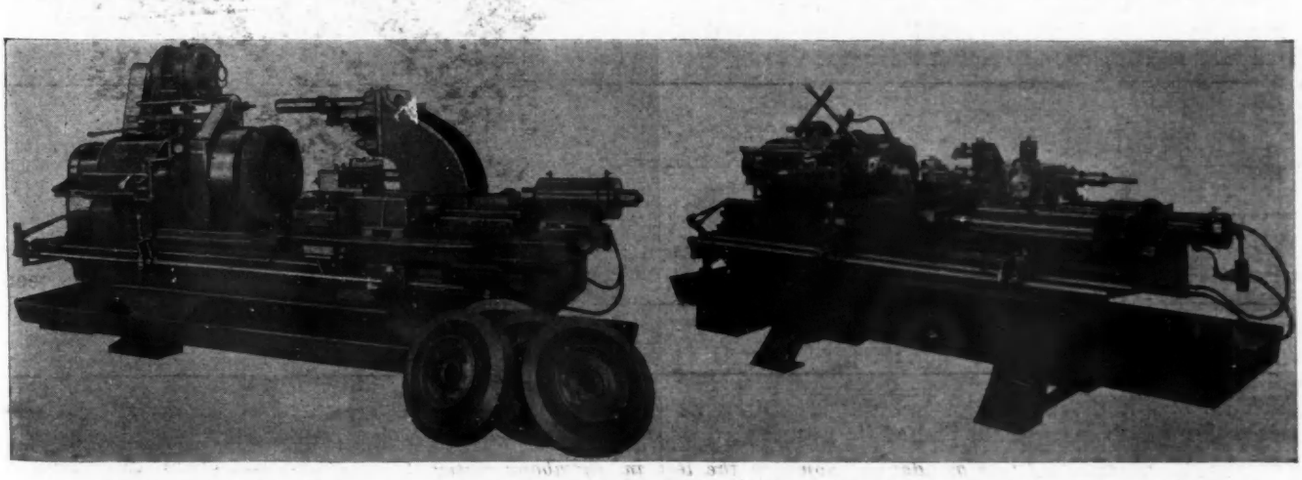
FASTERMATIC is the name of a new automatic chucking machine placed on the market recently by the Foster Machine Co., Elkhart, Ind. The machine is built in the platen and the automatic-indexing-turret type, each of which is now being manufactured in four sizes designated as 1-F, 2-F, 3-F and 4-F with respective swings over the bed of 17, 22, 25½ and 33 in.

A feature of the Fastermatic is that the feeding mechanism controlling movements of the tool carrying units is entirely gearless. All feeds are actuated from a hydraulic ram into which oil is forced from an oil gear control pump located on the head end of the machine and driven through a silent chain from the main drive shaft. During the period of feeding, a constant oil pressure is maintained on each side of the piston enclosed in the ram.

The feeding movements to the tool carrying units range from 0 to approximately 40 in. per minute. Feed changes are effected by varying the capacity of the pump and its delivery of oil to the ram. Cams which may be easily and quickly adjusted are provided for obtaining the desired feed and to automatically maintain it after it is adjusted. The return of the tooling from the work and back to position at the completion of all machining operations is effected automatically through the traverse of the ram.

At the completion of the entire operation cycle, the tooling is retained in the returned position until the feed is engaged by hand. Another feature of the feeding movement is that the rapid traverse movement can be restarted automatically during any portion of the feeding movement.

The features described are generally characteristic of both types of the machine. There is, however, a wide distinction between them. With the platen type Fastermatic, the tool-carrying units consist of a front and a rear cross slide and a main slide, all of which are mounted on a platen. The platen, through the action of a ram, carries the tooling to the correct position for the beginning of the machining operations, and away from the work after the tooling units have receded on completing the cutting operations.

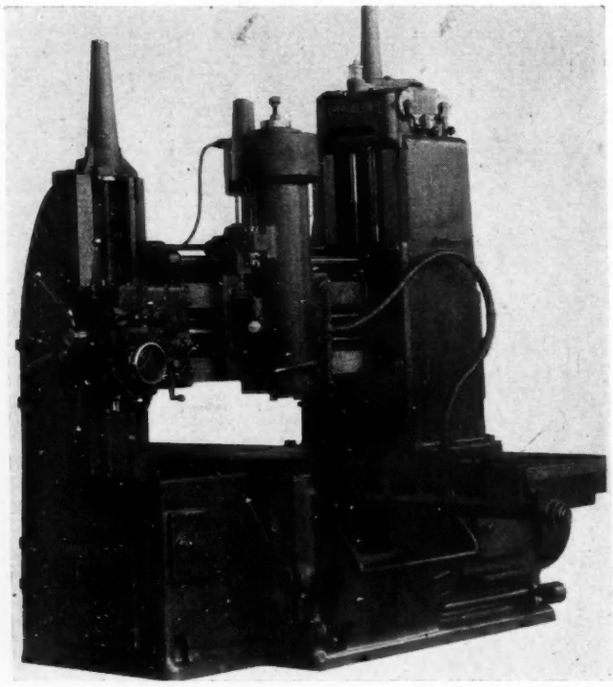


To the left is the Fastermatic 4F platen type chucking machine and to the right is the 2F turret type

In the 1-F and 2-F machines, eight spindle speeds are available, while in the 3-F and 4-F machines there are 12 spindle speeds. All Fastermatics are equipped with Timken bearing spindles, ball bearing back shafts, multiple disk clutches and an all-steel gear train operating in oil.

Bridge Type Mil-Waukee-Mil

(Booth 2 B-7, West Annex)



Bridge type Mil-Waukee-Mil

THE Kearney & Trecker Corp., Milwaukee, Wis., announce the new Bridge Type vertical Mil-Waukee-Mil, shown above, as an important addition to their line.

Barnes Drilling Machine

(Booth 2 B-9, West Annex)

W. F. and JOHN BARNES CO., Rockford, Ill., will exhibit at the National Machine Tool Exposition in Cleveland, the No. 430 Horizontal Duplex Long Hole Drilling Machine, also their No. 910 Vertical Hydraulic and the No. 930 Vertical Hydraulic.

Osterlein Mil-O-Matic

(Booth 1 A-13, West Annex)

THE Osterlein Machine Co., Cincinnati, Ohio, expect to exhibit the No. 36 Mil-O-Matic which is an automatically operated, hydraulic feed, bed type milling machine. It may be equipped with either a plain reciprocating table having surface 21 in. x 43 in. affording a 36-in. feed, or with an automatic indexing table of 14 in. x 24 in. working surface mounted on a slide which has 24-in. feed. As an indexing machine the table makes a half turn at the end of its return stroke, and advances again to cut. The machine is designed to be available as a single spindle, duplex, vertical, or multiple spindle machine, with several standard bed and table lengths. Special heads may also be applied, depending on requirements.

By pulling the starting lever forward the spindle runs right-handed, while pushing it backward causes it to run in the reverse direction. In the neutral position, power is disengaged and the spindle stops. An 8-in. adjustment for spindle and a 14-in. vertical adjustment for the spindle-head are provided in the design. Under ordinary operating conditions, springs operate a load and fire device and keep the control lever on one side or other of neutral. The table therefore automatically continues to reciprocate and indes. However, an interference device is provided. When set to interpose the repeat, it stops the table at the end of its travel at its greatest distance from the cutter.

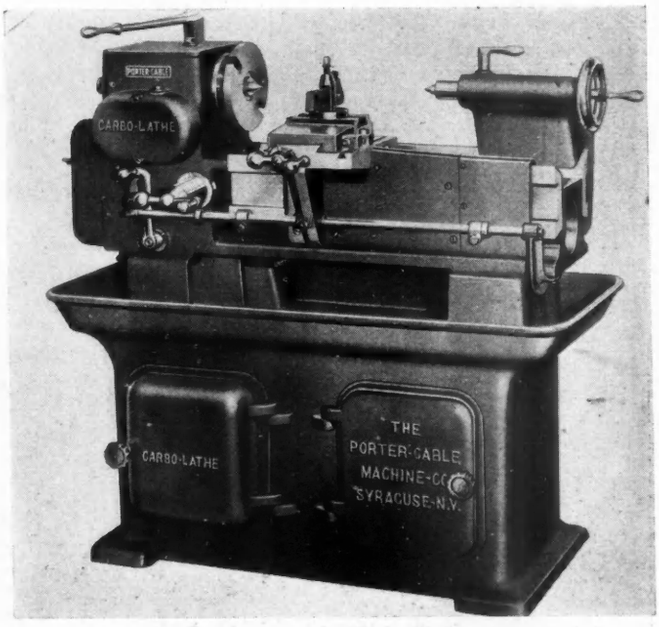
A 10 hp., 1740 r.p.m. motor is required to drive each standard spindle to capacity. A 5 hp., 1200 r.p.m. motor is required for driving the Oil Gear unit, and a ½ hp. built-in motor is provided with the pump.

Porter-Cable Carbo-Lathe

(Booth 1 W-19, West Annex)

THE Porter Cable Machine Co., Syracuse, N. Y., offers a new production lathe incorporating the well-known features of their other lathes but designed specifically for tungsten carbide cutting tools, although other high speed tool steels can be used.

This machine has a 12-in. swing and 18 in. between centers. Great rigidity is obtained as the head stock and the bed are one casting of chrome nickel iron, thus doing away with weaving of head stock. The tail stock is of heavy one-piece construction (approximately 100 lb.) and is rigidly clamped to the bed by two draw bolts on a heavy gib. The ways are relieved in the center so that a two-point contact results.



Porter-Cable Carbo-Lathe

In this manner rigidity of tail stock is secured, eliminating rocking. This arrangement of the tail stock permits free travel of the carriage underneath the tail spindle, also allows setting close up to short work without unduly extending the tail spindle.

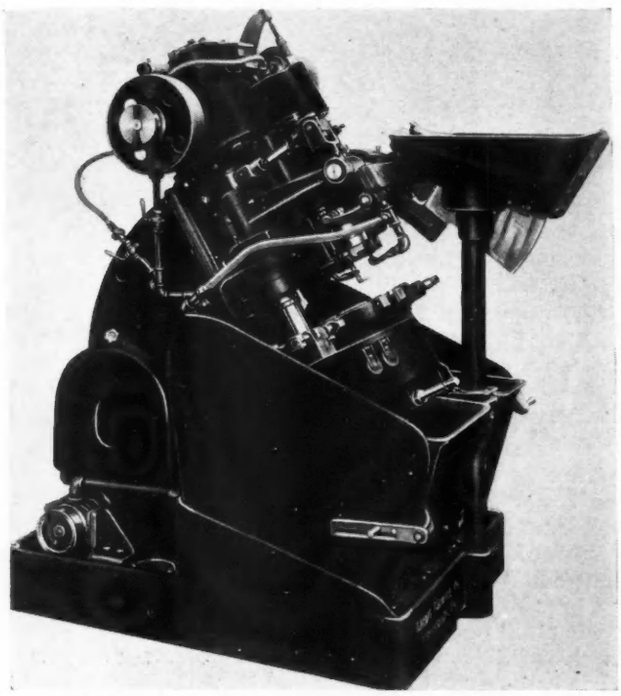
This feature is largely responsible for the shortening of the lathe, thus reducing the required floor space. The centers are No. 3 Morse Taper made from high speed steel. Power is furnished by a motor of 3 or 5 hp. concealed in the cabinet base and away from dirt, although direct line drive can be used if desired.

A regular wheel operated tail stock is standard equipment. However, it can be changed over to a lever action by removing wheel parts and substituting lever mechanism. This mechanism is adjustable for two lengths of travel, 2½ in. and 4 in.

Automatic Forming Machine

(Booth 1 B-8, West Annex)

THE Landis automatic forming and threading machine manufactured by the Landis Machine Co., Waynesboro, Pa., automatically points and threads bolts. It has a range from 5/16 in. to ¾ in. diameter; and from 1 in. to 6 in. for length of bolt or screws;



Landis automatic forming and threading machine

while the longest thread that can be cut is 2½ in. The bolts are shoveled or dumped into the hopper and are delivered to the transfer fingers through a magazine leading from the hopper.

The transfer fingers take the bolt and place it in the grips which are located in a three-station turret. An instant prior to the loading of the bolt in the grips, the bolt already pointed and threaded is unloaded and falls into an oscillating chute. The oscillating chute delivers the bolt to the rear of the machine in the tote box.

The company has designed a new escapement attachment for this machine. This attachment is intended to be used in connection with long hexagon and square head bolts, and bolts and screws having offset heads, such as rim, plow and step bolts.

The escapement attachment is built in the magazine and releases one bolt at a time at the end of the magazine, thereby relieving the bolt to be transferred to the chuck turret of the weight of bolts in the magazine and preventing interference of bolt heads. This attachment covers the entire range of machines from 5/16 in. to ¾ in. diameter and 1 in. to 6 in. in length.

Link-Belt Chain

(Booth 4 C-1, Arena)

AN application of Link-Belt chain and sprockets on a semi-automatic broaching machine has been developed by the Amalgamated Metal & Machine Co. of Cleveland, Ohio.

The first experimental machines built consisted mainly of two matched horizontal roller chain drives, between which were mounted broaching attachments, supported by and traveling in steel ways. These first machines were highly successful for the work for which they were intended, but were crude forerunners of the present machine. For example, the work tolerance on the experimental machines was very liberal, whereas on the new type, without any sacrifice in speed, the manufacturer claims .001 in. is a conservative tolerance.

On the new type machine the general layout is similar. There is no waiting for the return of the broach, as the machine runs only in one direction. At regular intervals there are attachments to hook on the broaches. These attachments or broach carriers are fastened between two endless matched strands of Link-Belt finished steel roller chain. Under each of these attachments a half nut is mounted which engages a screw or worm just beyond the movable face-plate. The worm is driven by spiral gears. There are always two of the nuts engaged. This is necessary for the continuous movement of the conveying chains. The attachments on which the half nuts are mounted travel in hardened steel ways.

A cam raises the face-plate on the approach of the attachments. When the attachment clears, the face-plate immediately falls, catching and holding the work while the broaches pull through.

Work is manually fed and automatically discharged.

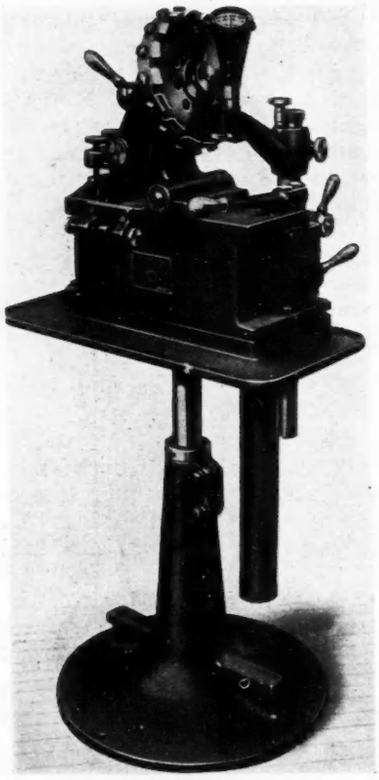
Link-Belt chain and sprocket applied to a semi-automatic broaching machine

The operator handles the work but once. This machine is adapted to both external and internal broaching.

Gleason Cutter Angle Tester

(Booth 1 B-4, West Annex)

THE Gleason Works, Rochester, N. Y., will show this new testing device which is used as a comparator to insure that the blades in the circular cutters used on Gleason spiral bevel and hypoid gear cutting machines are mounted to have absolutely identical cutting pressure angles. The blades being sold separately from the cutter heads, it is essential that they be carefully checked after assembly in the cutter head, as a slight variation in the angle of blades will cause flats on the teeth being cut.



Gleason cutter angle tester

Any corrective work necessary to locate the blade accurately for angle can be done on this new fixture without removing the cutter. The device includes an indicator reading in .0001 in. cutter head carrier against which the cutter is held by spring pressure, and a dovetail slide on which the carrier is angularly adjustable and which is slidable on the base of the fixture so that the blades in the cutter can be moved back and forth under the indicator finger. The slide is amply gibbed for taking up wear.

The indicator holder is vertically and horizontally adjustable on the base so it can be used for checking both inside and outside blades and the cutter head carrier has a wide range of angular adjustment for covering the full range of pressure angles. The unit is built in two sizes, one for 9-in. and the other for 12-in. cutters.

New Fay Automatic Lathes

(Booth 2 C-6 and Booth 1 A-10, West Annex)

THE following new machines will be shown at the Machine Tool Exhibition by Jones & Lamson Machine Co.:

A new 2½-in. Turret Lathe equipped with standard tooling on a conventional bar job. This machine is practically the same as their regular 2¼-in. machine except that it is made to accommodate larger diameter work.

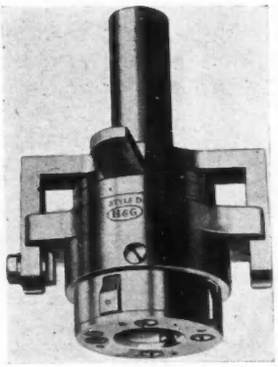
A 14 x 50 in. Fay Automatic Lathe equipped with a center drive and tooled to machine both ends of a large rear axle shaft in one operation. This is also the first time that the Fay Automatic Lathe will be shown equipped with the center drive, the chief advantage of which is that pieces requiring machining on both ends can be completed in one operation.

Two 24 x 42 in. Fay Automatic Lathes—one tooled for the roughing operation on a large tractor shaft, the other tooled for the finishing operation on this shaft.

H & G Die Head

(Booth 1 W-3, West Annex)

A NEW size of H & G Die Head is presented by the Eastern Machine Screw Corp., New Haven, Conn., at the exposition. This is a die head of 5/16 in. Style D head and is designed for Brown & Sharpe automatic screw machines of the 00 size and other small automatics.



This head enlarges the threading possibilities of such machines and provides stronger and heavier chasers than those used in the ¼-in. head.

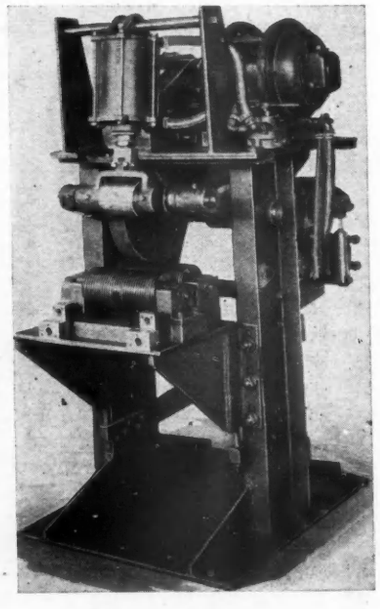
H & G die head is shown at the left

Ryerson Rotating Unit

(Booth 2 D-2, West Annex)

A ROTATING attachment for the Ryerson No. 0 Friction Saw has been developed which practically eliminates the burr in cutting round tubing, pipe, and bar stock, according to Joseph T. Ryerson & Son, Inc. The No. 0 Saw was designed for manufacturers requiring high production in cutting smaller sizes of material.

The new rotating attachment consists of a special work table on which are mounted supporting rollers for holding the stock in position while being cut. One set of rollers is driven by direct gearing from a fractional horsepower motor, through a speed reduction unit and gearing. A second set of rolls is mounted on an adjustable bracket which may be moved in or out to accommodate various sizes of stock. A third roller is brought down on top of the stock by means of an air cylinder arrangement which holds the stock firmly in position while it is being ro-



Ryerson friction saw

tated. This attachment provides rotation of constant peripheral velocity to any size of round stock which may be placed in the machine and eliminates chucking and change speed gears. The machine may easily be changed for cutting structural shapes by dropping the drive rollers and replacing the adjustable bracket with a work table plate. The main motor is a 10 hp., 3600 r.p.m. The saw blade is of the standard hobbed type and is 24½ in. in diameter.

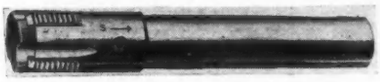
Non-ferrous metals such as aluminum, brass, bronze, zinc, and babbitt, which have heretofore required a slow speed cut-off saw, may now be handled on a high speed friction saw.

New Geometric Equipment

(Booth 1 W-21, West Annex)

THE Geometric Tool Co. of New Haven, Conn., is exhibiting for the first time at the National Machine Tool Builders' Exposition, four new products.

One of the principal features of the Class SJ Solid Adjustable Tap is that all working parts, even the size adjustment mechanism, are located in the nose or front end of the tool. Consequently, that portion of the tool carrying the chasers is the largest diameter of the tap, thus allowing the tap to cut threads to any required depth—the depth of tapping being limited only by factors outside of the tool, such as overhang, method of holding tap, etc.

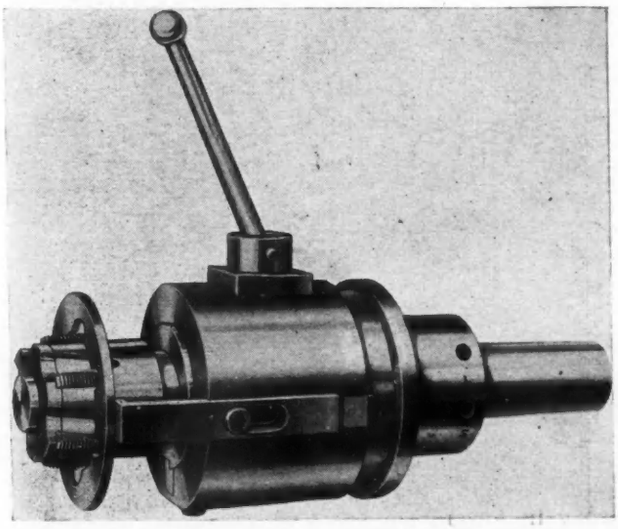


The Geometric Class SJ solid adjustable tap

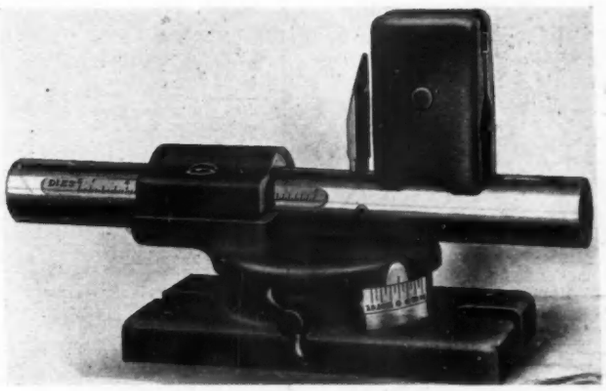
The Geometric Class SJ Tap is compact and will swing in a small space. It is short—it need be not much longer than the chasers, thus avoiding overhang and making it possible to swing it on special machines having a limited clearance.

The Class R Receding Chaser Tap is a geometric tap designed for tapping taper threads where the depth is great, the taper is steep, and the material is tough. The tap is a complete unit in itself. On even the bigger sizes no complicated outside tripping mechanism is required. All working parts are fully enclosed.

One of the most important features of this new tool is a size adjustment mechanism which is so readily accessible that adjustment can be made without removing the tool from its spindle or holder, yet which is so securely locked in place that the die head will not change its size even when suddenly and repeatedly reversed at high speeds.

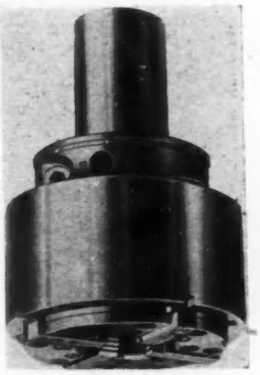


The Geometric Class R receding chaser tap



Geometric Universal chaser grinding fixture

Chasers may be quickly and easily replaced by merely pressing down a thumb release on the back of the tool and pulling the chasers out with the fingers. These same chasers while cutting are not only rigidly supported along the sides and bottom with a supplementary support from the face plate on top, but they are also rigidly backed up by a solid wall of metal directly behind the cutting point.



The Geometric Style KJ solid adjustable die head

Milled chasers, tapped (or hobbed) die head chasers, collapsing tap chasers, all may be reground with equal facility on the Universal chaser grinding fixture, even though this means a flat chamfer, a concave chamfer and a convex chamfer respectively. The cutting face of all these different types of chasers may also be reground on the same fixture giving the chasers just the required angle of hook or snub that is required by the work to be threaded. This fixture can be used on any Universal surface grinder or similar machine.

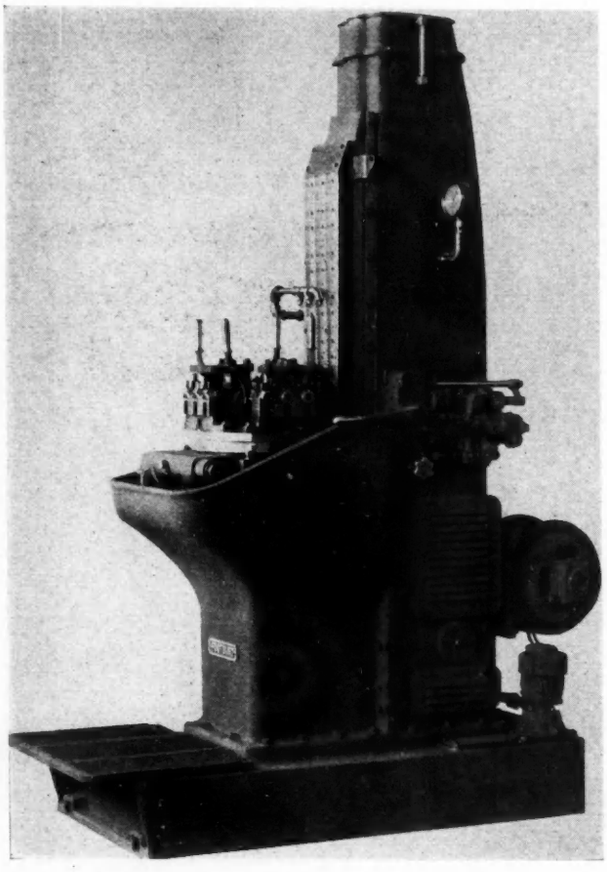
Footburt Shows Two Units

(Booth 1 A-12, West Annex)

A FOOTBURT No. 1 surface broaching machine and two No. 16 vertical multiple spindle drilling machines are announced by the Foote-Burt Co., Cleveland, Ohio.

The Footburt No. 1 surface broaching machine is used for roughing and finishing one or more flat or irregular surfaces in one operation. All work within certain size limitations is handled on a machine of standard dimensions but the fixtures and broaches are designed specially for each job.

The entire machining operation is accomplished at one pass of the broach. In most cases four station automatic indexing worktables are used and production is set at the speed at which the operator can load and unload the work. The reciprocating movement of the



Footburt No. 1 surface broaching machine

broach is accomplished by a hydraulic pump driven by a motor through silent chain belt running in oil.

Slow cutting speeds, averaging from 10 ft. to 40 ft. per minute, and solid support of the broach keep tool maintenance expense at the very minimum.

The broach holder is securely fastened to the broach slide, which is in turn bolted directly to the lower end of the hydraulic plunger or piston rod. The slide moves up and down on long narrow dovetail ways. The broach slide is supported at every point throughout its entire length.

The action of the slide is entirely automatic but it may be stopped or started at any point of the stroke by a hand lever, conveniently located for the operator, or it may be reversed by turning a small hand wheel.

Two new vertical multiple spindle drilling machines, the Footburt No. 16 with mechanical feed and the Footburt No. 16 Hydraulic with hydraulic feed, have been developed to keep pace with the demand for larger machines of this type. The No. 16 has 16-in. ways and the No. 16 Hydraulic has 20-in. ways. Both have the same drilling capacity, the No. 16 Hydraulic having a wider column and ways to accommodate the cylinder. The No. 15½ line has also been recently increased by the No. 15½ Hydraulic with 14-in. ways. The No. 15½ has 10-in. ways and the No. 15½-F has 12-in. ways.

Heads are individually designed with special gearing to secure the correct speeds and locations of the spindles. All spindles have ball thrust bearings and can be equipped with adjustable collets so that vertical adjustment can be made on individual spindles. Lubrication of the head is by means of a forced feed oiling system, oil being carried in the head and circulated by a pump mounted on the head itself and driven by a belt from the head drive shaft.

Barnes High-Speed Drill

(Booth 2 D-4, West Annex)

THE sliding head drilling and tapping machine, No. 262, introduced by the Barnes Drill Co. of Rockford, Ill., at the Cleveland Machine Tool Show, is self-oiling and all geared, with anti-friction bearings throughout.

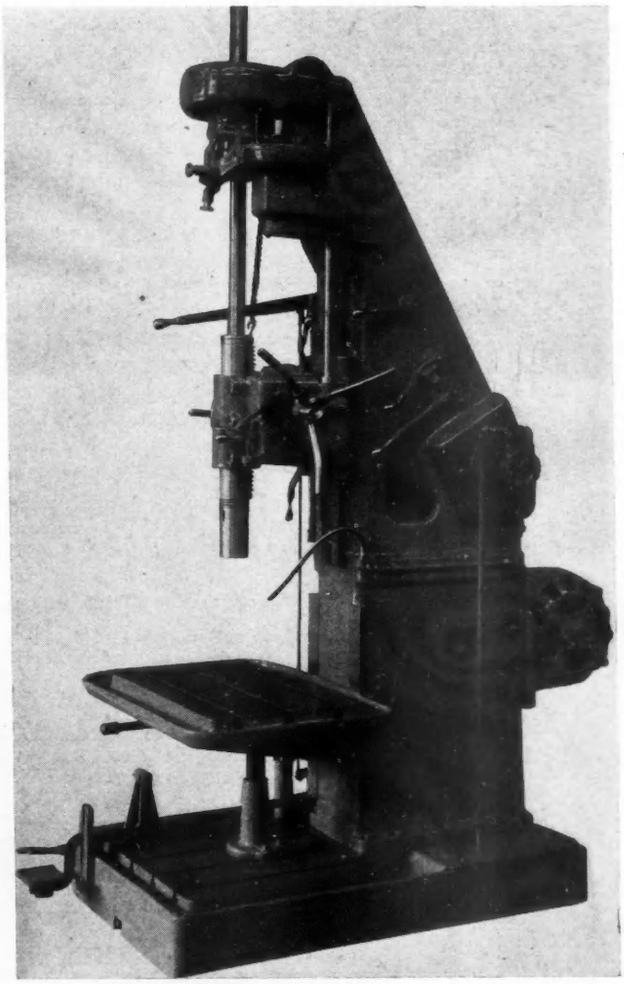
There are eight geared speeds in the unit, quick change, with lever control extended to the front for the convenience of the operator. Immediately in front of the machine are eight spur geared feeds, quick change, with lever control. All feeds and speeds are clearly indicated for each setting. Spiral crown gears of heat-treated steel are used, and are furnished in any one of three ratios: namely, 1:1, 2:1 and 3:2.

An oil sump is built into the base at the rear, and provision is made for covers when coolant pump is used.

The machine is furnished with silent chain drive (as illustrated) with the chain encased, or with single pulley drive if desired.

Every bearing is automatically oiled through the self-oiling system. The machine handles high speed twist drills up to 2½ in. at selected feeds and speeds. It bores an 8-in. hole in cast iron, and can be used for cylinder boring, deep hole work, heavy drilling and accurate tool room service.

The height of the unit is 94 in., the net weight with 5 hp. motor is 3500 lb. and the amount of floor space required is 30 by 53 in.

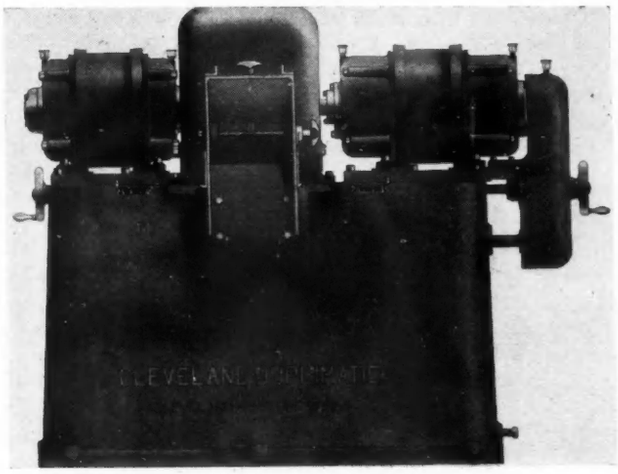


Barnes No. 262 high speed drill

Cleveland Disk Grinder

THE new "DUPLIMATIC" automatic double disk grinder is announced by the Cleveland Armature Works, Inc., Cleveland, Ohio.

This machine has a separate motor of 7½ hp. for each disk. The motor shaft is the spindle for the disk. The disk, shaft and motor complete are both statically and dynamically balanced and are mounted on adjustable Timken bearings.



Duplimatic disk grinder

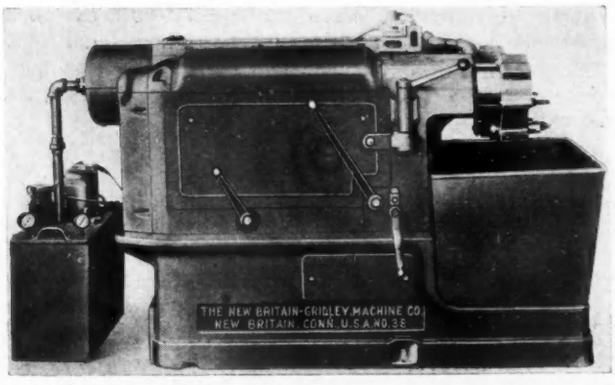
Both motors are easily adjusted longitudinally, giving a range for bushing lengths of 1 to 6 in. Etched brass scales are provided on front of machine for each motor. A micrometer adjustment is provided for one motor. The motors operate from a single push button station. They start simultaneously and build up speed at the same rate.

The feed is driven by a separate motor enclosed in the base. The drive is through nickel steel heat-treated spur gears and the final reduction through a hardened and ground-worm and phosphor bronze worm wheel. All the shafts for the feed drive are chrome-nickel steel, heat-treated and run on Timken bearings. The entire drive is self-lubricating. All operating parts are entirely enclosed and conform to Safety Code requirements.

New Britain Chucking Machine

(Booths 2 W-26 and 2 A-3, West Annex)

THE New Britain-Gridley Machine Co. is showing the new 38 New Britain Single Spindle Heavy Duty Automatic Chucking Machine. The unit is of the work rotating type, designed specifically for boring, turning, facing and forming anti-friction bearing races, ring gears or similar parts. It is capable of heavy cuts on forgings or castings and of producing work within close limits.



No. 38 New Britain chucking machine

It is quite compact and rigid in construction, occupying 18 sq. ft. of floor space, the motor being enclosed in the base. It has a chucking capacity of 10½ in.

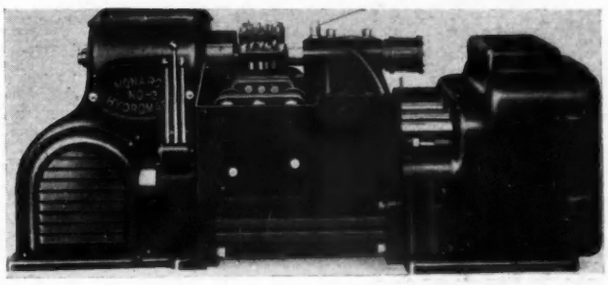
Monarch Hydromatic Lathe

(Booth 2 W-21, West Annex)

A NEW application of hydraulics is employed in the Monarch Hydromatic No. 3 Lathe, according to the Monarch Machine Tool Co., of Sydney, Ohio, in announcing the model.

Both front and rear carriages of this new Monarch lathe can be equipped with length feed and quick traverse. The front and rear tool slides can be provided with cross feeding travel and quick traverse. Complete cycle of both carriages and tool slides is automatic. All controls are hydraulic. Positive adjustable diameter and length stops insure perfect duplication of cuts and minimum of set-up time. Automatic variation of feeding rate can be provided. Changes of feeding rate are almost instantly made.

The headstock unit is a separate casting. A powerful, easily adjusted, Monarch Edgemont multiple disk driving clutch takes its power from the motor mounted in the base. The spindle is worm-driven. Pick-off gears on the front of the headstock provide a quick means of securing any spindle speed desired. All working parts dip in oil. A coolant pump of 80 gal. per min. capacity is mounted in headstock housing and is driven from the main motor. One starting lever starts spindle, coolant and hydraulic feeds on both carriages.



Monarch No. 3 hydromatic lathe

The middle section is the cast-iron chip and coolant reservoir. It is keyed and bolted to the headstock and tail-end housing.

The tail-end housing contains the hydraulic mechanism which is easily accessible through large doors on the end. A 2 hp. motor in this housing drives the two oil-gear hydraulic pumps.

Sykes Gear Products

(Booth 3 W-5, Arcade)

FARREL-BIRMINGHAM CO., Buffalo, N. Y., will exhibit the following improved equipment:

The Sykes Gear Generator size 1A is similar in design to their 2A machine, but is smaller, capable of higher speed, and designed particularly for the automotive field. It generates straight tooth, helical tooth and Sykes herringbone tooth gears up to 12 in. diameter and 5-in. face.

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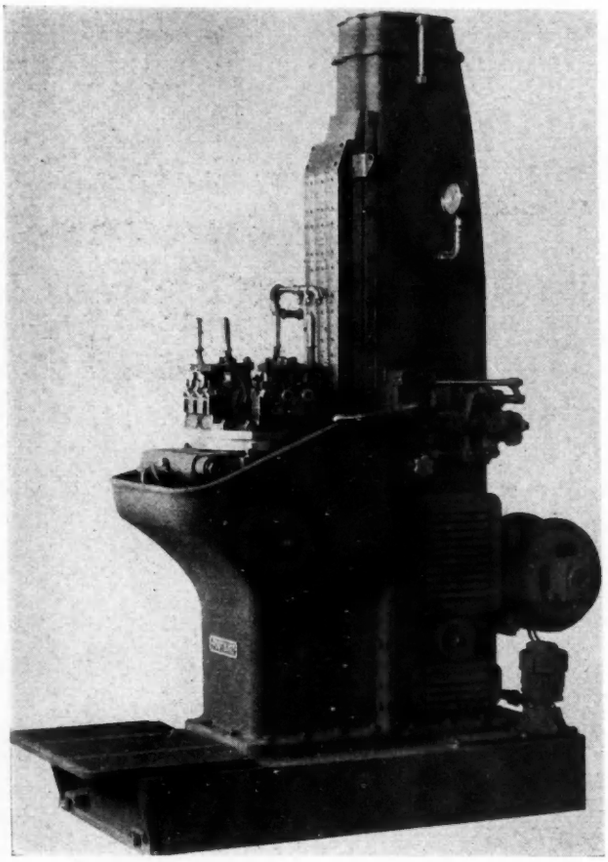

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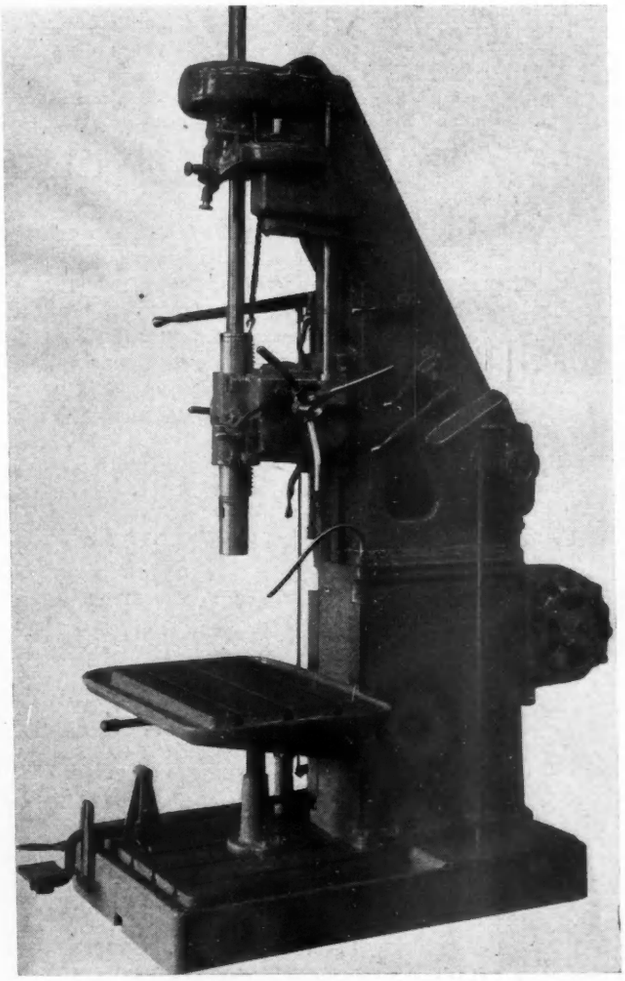

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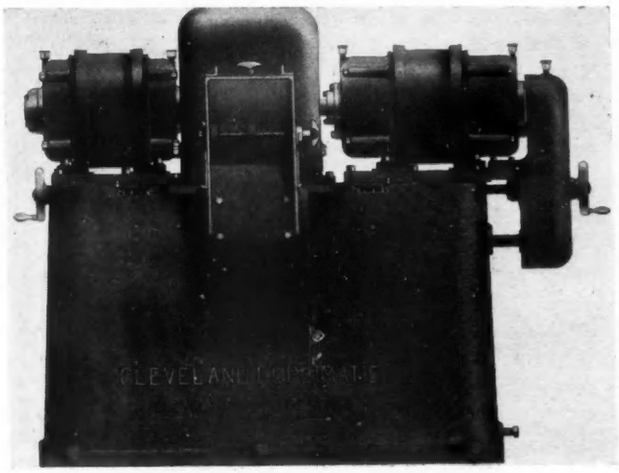

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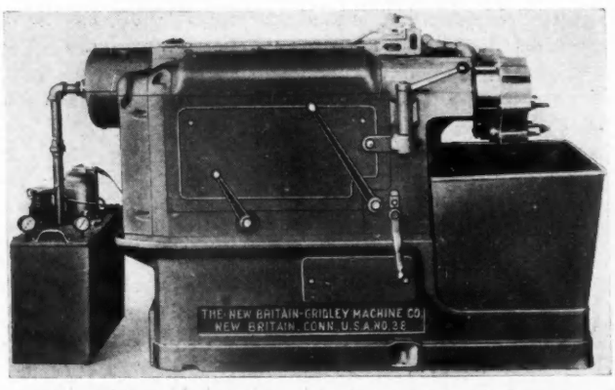

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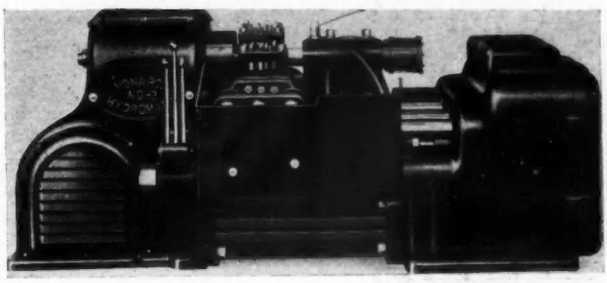

Monarch No. 3 hydromatic lathe

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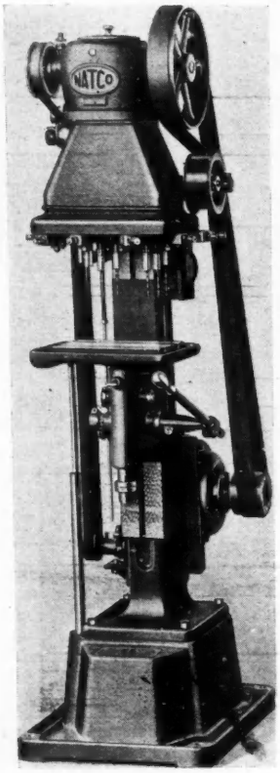
The Sykes 40 deg. helical angle herringbone gear is

now available in small sizes suitable to automotive requirements.

The Sykes Gear Tooth Comparator has been improved to detect errors in gear teeth to within 0.0001 in. instead of 0.001 in limit previously possible.

Natco Driller and Tapper

(Booth 1 D-1, West Annex)



THE Model C5 standard Natco adjustable multiple spindle driller and tapper is a small machine which may be operated with either hand or foot feed. Two types of heads have been designed for it, both with ten spindles; one for drilling only and one for drilling and tapping. A standard tee slot is machined in the flange of the head for attaching the spindle and arm equipment.

A specially designed attachment for tapping which is controlled by a shift clutch and trip mechanism is also provided. The table is of the adjustable knee type arranged for either hand or foot feeding. The minimum height of the working surface of the table is 31 in. with a 13¼-in. adjustment. Two tee slots which run lengthwise of the table are provided for clamping the work.

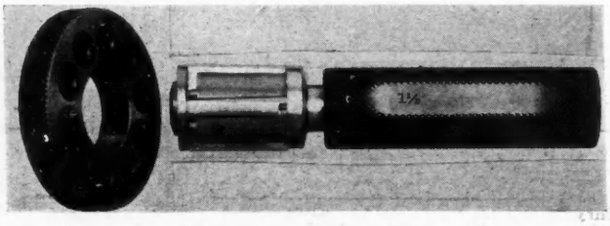
Model C5 Natco Driller

Bath Adjustable Gage

(Booth 5 W-1, Arena)

THIS gage, made by John Bath & Co., Inc., Worcester, Mass is an adaptation of the Bath internal micrometer. It is designed to take the place of the ordinary solid plug gage.

Its principal feature is adjustment for wear by means of movable jaws and a screw in the handle. This adjustment is quickly and easily made by applying a wrench to the screw in the handle and bringing the jaws up to the size of the master ring. A lap is provided with each gage to restore parallelism to worn jaws.



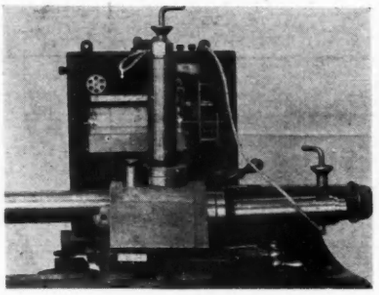
Bath adjustable gage

Hall Machinabilimeter

(Booth 2 W-11, West Annex)

THE Machinabilimeter is a metal cutting instrument designed to give definite information about the machinability or machining qualities of any metal. The Hall Planetary Co., builder of the Hall Planetary Milling Machines, announces this new instrument which they believe marks an important advance in the metal working art.

In design the Machinabilimeter is very simple as is evident from the illustration. It consists essentially of a heavy block, carrying a floating tool holder which communicates with a vertical and horizontal cylinder. The cylinders contain oil and under compression transmit fluid pressure by means of oil leads to recording meters, one of which is shown. This instrument is adaptable for study on any machine tool.



Hall Machinabilimeter

The underlying principle and method of operation may be readily illustrated by describing a typical test: A bar of the metal to be studied is set up on centers in a lathe. The Machinabilimeter is mounted on the bed in place of the tool rest. The tool holder is fitted with a circular cutter which is notched to form several individual cutting tool forms of different hook and angle of rake. The cutter is pivoted and can be locked radially with any formed notch selectively in position to cut. The first step is to select the correct cutting tool form. This is quickly determined by taking a cut with any cutter and noting the reading of horizontal cylinder pressures on a gage not shown here. If the cutting tool is not of the proper form it will register fluctuating deflections on an indicator fitted to the horizontal cylinder. Moreover, the pressure gage will show either a high pressure or wide variations in pressure.

The final step determines the vertical thrust on the point of the tool. Here lies the most important function of the instrument as this test shows the character of the metal, uniformity of structure and correct cutting speed. With the proper cutting tool in place, a cut is taken along the entire length of the test piece with readings of vertical thrust recorded on the Brown Recording Meter shown here. Pressures may vary widely from a mean of all the readings. This is characteristic of the particular sample under test and shows lack of uniformity in structure, since pressures below the mean show soft spots and above the mean show hard spots. Now, the minimum value of the mean pressure on the tool can be established by suitably varying cutting speed and feed.

Marking Machines and Tools

(Booth 5 W-3, Arena)

A COMPLETE line of marking machines and marking tools will be shown by the Noble & Westbrook Mfg. Co., Hartford, Conn.

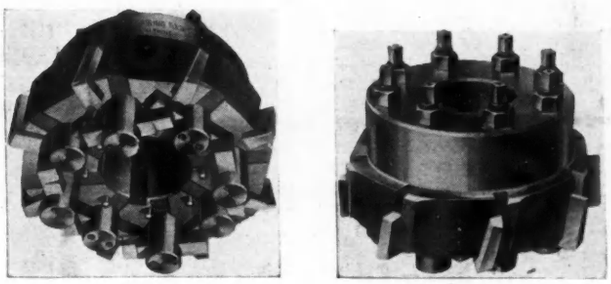
Included in their exhibit will be the new No. 41

Graduating Machine for graduating micrometer collars. Also the No. 4 General Purpose Hand Operated Marking Machine and supplement their power operated types.

Gairing Swing Tool Boring Head

(Booth 4 B-2, Arena)

THE Gairing Tool Co., Detroit, Mich., announces a new swing tool boring head. It is provided with tools which are pivoted and adjustable to and from the cutting position. This feature permits cutting different size diameters in one piece regardless of their relative location.



Gairing Boring Heads

Thus a large diameter may be bored, then the tools adjusted to cut a smaller diameter, and once again readjusted for a larger diameter. Another feature is that boring may be done on both forward and return stroke. It is claimed that this method assures concentricity of all bores and results in extreme accuracy.

Producto Ball Yoke

(Booth 1 W-14, West Annex)

SLITTING and grooving of ball yokes for automobile universal joints at the rate of 500 pieces an hour will be demonstrated by the Producto Machine Co., Bridgeport, Conn., on its new 50 Producto-Matic Milling Machine. The machine is arranged for motor drive and with vertical as well as horizontal travel of the cutter. The two operations, at right angles to each other, are done simultaneously.

Being motor-driven the machine is self-contained. It has a built-in four-station flat turret type work holding fixture, and when in operation two stations are in the milling position and two in the loading and unloading position. In the first milling position, the slitting operation is performed by a double spindle cutter block in tandem, having two saws on each cutter spindle. For the second operation the table indexes 90 deg. and the piece then grooved by means of an auxiliary cutter spindle mounted on the cross slide of the machine and is driven by a separate 1 hp. motor. This miller is adaptable to a wide range of pieces that require two milling operations at right angles to each other.

Exhibitors at the Machine Tool Show

Name of Firm	Booth No.
Abrasive Machine Tool Co.	2W 5
Acme Machine Tool Co.	2B 14
Acme Machinery Co.	2D 5
Ahlberg Bearing Co.	4W 10
Allen Co., Chas G.	1W 11
Allis-Chalmers Mfg. Co.	5C 11
American Broach & Machine Co.	1W 22
American Machinist	1E 2
American Tool Works Co., The	2D 3
Armstrong Bros. Tool Co.	4C 2
Armstrong-Blum Mfg. Co.	4A 5
Arter Grinding Machine Co.	1W 8
Associated Machine Tool Dealers	2W 0
Atkins & Co., E. C.	5C 6
Automatic Nut-Thread Corp.	3W 2
Automotive Industries	4W 7
Avey Drilling Machine Co.	1A 6
Baker Bros	2B 13
Baker-Raulang Company	4W 6
Barber-Colman Co.	1C 2
Barnes Co., W. F. & John	2B 9
Barnes Drill Co.	2D 4
Barrett Co., Leon J. (with Stockbridge Machine Co.)	1W 13
Bath & Co., John	5W 1
Bausch & Lomb Optical Co.	6A 5
Besly & Co., Charles H.	2D 6
Biax Flexible Shaft Co.	5A 6
Black & Decker Mfg. Co., The	4B 1
Blakeslee & Co., G. S.	4C 3
Blanchard Machine Co.	1W 5
Blount Co., J. G.	1W 2
Bowen Products Corp.	5A 7
Boyne & Emmes Machine Tool Co., The	3W 7
Bradford Machine Tool Co.	2A 4
Bridgeport Safety Emery Wheel Co.	1A 5
Brown & Sharpe Mfg. Co.	2C 8
Bryant Chucking Grinder Co.	2B 12
Buckeye Portable Tool Co.	4A 1
Buffalo Forge Co.	1A 4
Buhr Machine Tool Co.	2D 7
Bullard Co., The	1B 1
Canadian Machinery (MacLean Publishing Co.)	5C 7
Canedy-Otto Mfg. Co.	5C 10
Carboloy Co., Inc. (with General Electric Co.)	4A 2
Carlton Machine Tool Co., The	2B 2
Chicago Belting Co.	5W 7
Chisholm-Moore Hoist Corp.	6B 6
Cincinnati Bickford Tool Co.	2A 1
Cincinnati Grinders Corp. (with Cincinnati Milling Machine Co.)	2C 7
Cincinnati Lathe & Tool Co., The	2W 18
Cincinnati Milling Machine Co., The	2C 7
Cincinnati Shaper Co.	2W 17
General Radial Drilling Mach. Co.	2W 14
Cleveland Automatic Machine Co.	2C 5
Cleveland Hobbing Machine Co.	1A 10A
Cleveland Planer Co.	1C 3
Cleveland Twist Drill Co., The	4W 11
Cochran-Bly Co.	2C 12
Colonial Tool Co.	5A 4
Columbia Machine Tool Co.	2W 15
Conradson Tool Corp.	4A 3
Consolidated Machine Tool Corp.	2C 4
Covel-Hanchett Co.	2A 9
Cushman Chuck Co., The	5B 2
Cutler-Hammer, Inc.	6A 1
Danly Machine Specialties	4B 6
DeVlieg Machine Tool Co.	2A 2
DeWalt Products Corp.	6B 5
Diamond Machine Co.	2A 8
Disston & Sons, Inc., Henry	4B 8
Dreses Machine Tool Co., The	2W 12
Eastern Machine Screw Corp, The	1W 3
Eclipse Interchangeable Counterbore Co.	5B 4
Economy Engineering Co.	1W 15
Elwell-Parker Electric Co.	6B 1-2
Ex-Cell-O Tool & Mfg. Co.	5A 9
Fafnir Bearing Co., The	5W 10
Fairbanks, Morse & Co.	5C 9
Farrel-Birmingham Co., Inc.	3W 5
Fellows Gear Shaper Co.	2B 8
Flather Co., The	1W 4
Foley Saw Tool Co., Inc.	6B 3
Foote-Burt Co.	1A 12
Fosdick Machine Tool Co.	1A 3
Foster Machine Co.	2C 2
Fredericksen Co.	5W 6
Frew Machine Co.	3W 16
Gairing Tool Co., The	4B 2
Gallmeyer & Livingston Co.	2B 15
Gardner Machine Co.	1W 20
Gaterman Mfg. Co., W.	5C 2A
Gears & Forgings, Inc.	3W 15
General Electric Co.	4A 2
Geometric Tool Co.	1W 21
Giddings & Lewis Machine Tool Co.	2C 11
Gisholt Machine Co.	1C 4
Gits Bros. Mfg. Co.	5A 8
Gleason Works	1B 4
Goddard & Goddard Co., Inc.	3W 13
Goss & De Leeuw Mach. Co., The	1B 3
Gould & Eberhardt	1B 6
Greenfield Tap & Die Corp.	3W 8
Greenlee Bros. & Co.	1B 3
Hall Planetary Co., The	2W 11
Hammond Manufacturing Co.	5A 2
Hanna Engineering Works	3W 10
Hannifin Mfg. Co.	5B 9

Name of Firm	Booth No.
Hanson Whitney Machine Co.	2B 6
Hardinge Bros., Inc.	2W 7
Heald Machine Co.	2A 7
Hendey Machine Co., The	1D 2
Henry & Wright Mfg. Co., The	2W 4
Higley Machine Co.	2W 9
Hill-Curtis Co.	2W 8
Hisey-Wolf Machine Co.	2W 22
Hoefer Mfg. Co.	2W 1
E. F. Houghton & Co.	6B 4
Hyatt Roller Bearing Co.	5A 5
Hydraulic Press Mfg. Co.	3W 4
Illinois Tool Works Co.	5C 1
Ingersoll Milling Machine Co.	1C 1
International Machine Tool Co.	1W 16
Iron Age Publishing Co.	5W 6A
Iron Trade Review (See Penton Pub. Co.)	
Jones & Lamson Machine Co.	2C 6, 1A 10
Kane & Roach, Inc.	3W 14
Kearney & Trecker Corp.	2B 7
Keller Mechanical Engineering Corp.	2C 3
Kelly Reamer Co.	5W 12-13
Kempsmith Mfg. Co.	1B 7
Kent Machine Co.	5A 1A
Keystone Lubricating Co.	6A 2
King Machine Tool Co.	1A 2
Kingsbury Machine Tool Corp.	2W 10
Knight Machinery Co., W. B.	1W 10
Laidlaw, Inc., William	5B 3
Landis Machine Co.	1B 8
Landis Tool Co.	1W 18
LaSalle Tool Co.	3W 12
LeBlond Machine Tool Co., R. K.	2C 1
Lees-Bradner Co.	3W 1
Lehmann Machine Co.	2W 24
Leland-Gifford Co.	2B 1
Lincoln Electric Co., The	5A 3
Link-Belt Co.	4C 1
Lodge & Shipley Machine Tool Co.	2B 11
Logansport Machine Co.	1W 9
Lucas Machine Tool Co.	1W 17
Ludlum Steel Co.	6A 4
Machinery	1E 1
Madison-Kipp Corp.	5W 11
Manning, Maxwell & Moore, Inc. (Putnam Machine Works)	2B 5
Marlin-Rockwell Corp.	4W 14
Marschke Mfg. Co. (with Black & Decker Mfg. Co.)	4B 1
McCrosky Tool Corp.	5W 14
Michigan Tool Co. (with Colonial Tool Co.)	5A 4
Mill & Factory Illustrated	5C 2
Modern Machine Shop	4W 8
Modern Machine Tool Co.	5B 6
Moline Tool Co.	2C 9
Monarch Machine Tool Co.	2W 21
Morse Chain Co.	5W 10A
Morton Mfg. Co.	3W 19
Murchey Machine & Tool Co.	2W 23
National Acme Co.	1B 5
National Automatic Tool Co.	1D 1
National Machinery Co.	1A 8
National Twist Drill & Tool Co.	4B 5
New Britain-Gridley Machine Co.	2W 26, 2A 3
New Departure Mfg. Co., The	5W 5
Niagara Machine & Tool Works Co.	3W 20
Noble & Westbrook Mfg. Co., The	5W 3
Norma-Hoffmann Bearings Corp.	4W 4
Norton Company	2A 10
Niles-Bement-Pond Co.	2D 9
Oakite Products, Inc.	4W 1
Oesterlein Machine Co.	1A 13
Ohio Machine Tool Co.	2D 8
Oilgear Co., The	2A 5
O. K. Tool Co., Inc.	4B 7
Oliver Instrument Co.	1W 6
Oster Mfg. Co., The	3W 17
Peerless Machine Co.	1A 11
Penton Publishing Co. (Iron Trade Review)	5W 9
Porter Cable Machine Co.	1W 19
Potter & Johnston Machine Co.	3W 6
Pratt & Whitney Co.	2D 1
Producto Machine Co., The	1W 14
Prosser & Son, Thomas	4C 6
Q-C Engineering & Tool Sales, Inc.	4A 6
Racine Tool & Machine Co.	2W 20
Ramsey Chain Co., Inc.	4W 3
Reed-Prentice Corp.	2W 2-3
Reliance Elec. & Eng. Co.	6A 6
Rickert-Shafer Co.	2C 10
Rivett Lathe & Grinder Corp.	5B 5
Rockford Drilling Machine Co.	2W 25
Rockford Machine Tool Co.	2B 3
Ross Mfg. Co., The	4W 9
Rotor Air Tool Co.	5B 8
Ryerson & Son, Inc., Joseph T.	2D 2
Safety Grinding Wheel & Machine Co., The	2B 10
Sebastian Lathe Co.	1W 24
Sellers & Co., Inc., Wm.	2A 6
Seneca Falls Machine Co.	1A 9
Sidney Machine Tool Co., The	2W 6
Siewek Tool & Die Co.	6A 3
Simonds Saw & Steel Co.	4B 4
SKF Industries, Inc.	4W 12
Skinner Chuck Co.	4W 13
Sleeper & Hartley, Inc.	5A 1
Smith & Mills Co.	2W 19
Springfield Machine Tool Co.	1W 7
Standard Electrical Tool Co.	4C 4
Standard Steel Specialty Co.	5C 5
Standard Tool Co., The	5W 2
Stark Tool Co.	1W 23
L. S. Starrett Co.	5W 8
Stockbridge Machine Co.	1W 13
Stuart & Co., Inc., D. A.	4W 5
Sundstrand Machine Tool Co.	1A 7
Sun Oil Co.	4A 4
Superior Machine Tool Co.	3W 18
Swift Welder Co. (with Ohio Machine Tool Co.)	2D 8
Taft-Pierce Mfg. Co.	3W 11
Taylor & Fenn Co., The	2A 3A
Thompson Grinder Co.	2W 13
Timken Roller Bearing Co., The	4W 2
Titeflex Metal Hose Co.	5B 7
Torrington Co.	1W 1
Tuthill Pump Co.	5C 3
Twin Disc Clutch Co.	4W 15
Union Mfg. Co.	5C 8
U. S. Electrical Tool Co., The	1A 15
Universal Boring Machine Co.	2B 4
Van Dorn Electric Tool Co.	4B 3
Van Norman Machine Tool Co.	1A 14
Walker Co., Inc., O. S.	2W 8A
Warner & Swasey Co., The	1A 1
Westinghouse Elec. & Mfg. Co.	5B 1
Whitney Mfg. Co. (with Hanson Whitney Machine Co.)	2B 6
Whitney Metal Tool Co.	2W 16
Williams Tool Corp.	3W 3
Wisconsin Electric Co.	5C 4
Yale & Towne Mfg. Co., The	4C 5

Metallurgists And Motor Industry Linked

(Continued from page 399)

any of the several other plating metals are secured.

"As you all know, unlike most electrodepositions, chromium is not obtained through the disintegration of metallic chromium anodes, but through the reduction by electrolysis of chromic acid. The amount of chromic acid annually consumed in chromium plating plants indicates that during the past year more than 500 tons of chromium was electrodeposited."

"Commercial electroplating in the United States has advanced in the last dozen years from the control of the skilled foreman to the supervision of the plant chemist," Mr. Taylor said in concluding. "A further step forward is in the offing. Chemists have already developed the fact that the crystal structure of the metal underneath is more or less reproduced in the electroplated coating. Consequently, both the bond between the base metal and its subsequent overlay and the continuity of the electroplate itself is influenced by the surface crystal structure of the base. The metallurgist, therefore, has a direct interest in electroplating development, and his aid will produce metal surfaces and characteristics especially suited to the needs of the electroplater."

Another interesting development of the week was the assumption of definite form by a movement to organize the commercial heat treaters of the United States into an association for fostering a national advertising campaign on their behalf, and to work for the betterment of the standards and ethics in their industry. The idea is being sponsored by N. M. Salkover, vice-president of the Queen City Steel Treating Co., of Cincinnati, and Stanley P. Rockwell, of the Stanley P. Rockwell Co., Hartford, Conn., inventor of the Rockwell hardness tester.

This year marked the first time that the non-ferrous group in the metallurgical field came into the exposition or congress to any large extent. At the exposition, where the products of 275 exhibitors covered 80,000 sq. ft. of floor space in the Cleveland Auditorium and Annex, considerable attention was attracted by the exhibits of the Aluminum Co. of America, the American Brass Co.

and the New Jersey Zinc Co.

Stainless steel, or rustless iron, was among the products that drew the attention of the automotive men, who attended both the exposition and congress in large numbers. It was estimated that the number in that group who held executive positions in automotive manufacturing concerns was greater than at almost any previous exhibition or assembly of the kind, not excepting the one held in Detroit in 1922.

Considerable experimenting now is being conducted in the laboratories of automotive plants with stainless steel. Thus far its use in automotive production has been rather limited. Parts made of it, however, are replacing in certain instances those that are plated with nickel or chromium. Oakland and Pontiac are using stainless steel hood hinges, while Hupp has adapted rustless iron for running board moldings. Door handles and covers for crank apertures also are being made of stainless steel.

J. C. Lincoln, Cleveland section representative of the American Welding Society at the National Metal Congress in Cleveland last week

Naturally, exceptional interest was shown by the automotive group in the tungsten-carbide cutting tools, which made their debut but a year ago at the exposition in Philadelphia. These high-speed cutting tools have increased automotive production greatly already in certain respects, and extensive experiments in their application to different forms of work still are under way. One of the uses to which the new cutting material is being applied is the grooving of pistons.

Displays of nitrided steel also were cynosures for the automotive men, who showed sincere interest in the metal despite their divided opinion as to how extensively it can and will be used in automobile production. As an example of one of its present applications in the manufacture of automobiles, Cadillac now is using nitrided steel in a part of its steering gear.

Automotive production men inspected carefully the new types of continuous-flow heat-treating furnaces, most of which were for small parts. Particular note was taken of the heat-resisting alloys of which the insides, pans and chains of the furnaces were composed. The foundry exhibits also were scrutinized.

Demonstrations of appliances and methods for welding sheet metal more rapidly, with less burning of the metal than heretofore, were watched closely by the heads of automobile body plants.

Attention was given the hardness testers, and particularly the new Vickers type which, because of its diamond ball, is capable of testing harder materials than the Brinell devices.

Fred L. Llewellyn, president of the American Welding Society

Inquiries were made concerning a new type of steel for crankshafts and camshafts that does not require heat-treating. Experiments with this steel are being conducted by Hupp, Studebaker and Chrysler, the last named of which is said to be ready practically to specify that steel for making its connecting rods.

The exposition was said by many annual visitors to have been the best proportioned of any they had seen. It was predicted that the attendance total would set a new record. On the first day, from the time the exposition opened at 12 o'clock noon until it closed at 10 p. m., 9000 persons trod its aisles.

Among the score of visitors from abroad was Dr. Adolph Fry, director of the Krupp Steel Works, Germany, who invented the nitriding process, and P. F. M. Aubert of Paris, owner of the Krupp patent rights for the world, exclusive of Germany.

The exposition and congress will be held next year from Sept. 22 to 26 in the Stevens Hotel, Chicago, where it will be housed under one roof for the first time. That city was chosen out of respect to Robert G. Guthrie, chief metallurgist of the People's Gas, Light & Coke Co. of Chicago, who has been nominated for the presidency of the American Society for Steel Treating.

Welding Society Meeting

FOR its fall meeting, which was held last week, the American Welding Society had its headquarters at the Statler Hotel in Cleveland and technical sessions during the morning were held there, while the afternoon sessions were held in one of the parlors of the Cleveland Auditorium. In addition to the technical sessions and meetings of the board of directors and of the American Bureau of Welding (the research division of the society) the program provided for a tour of inspection of three plants in the city at which equipment and operations of interest to welders could be seen. This tour was made on Wednesday morning. A conference of research workers on the fundamentals of welding was held at the same time.

The program of papers covered quite thoroughly the different processes and applications of welding. More attention was given to the theoretical side, or what the society prefers to call the fundamentals of welding, than at any of the previous meetings.

Just Among Ourselves

Factory Merchandising Control is Increasing

THE last five years has seen a centralization of sales and merchandising responsibility throughout the automobile field which, continued at its present rate, bids fair within the next five years to rival the centralization of control which long ago came to prevail in the production end of every big factory.

Most of the makers of low-priced cars today are operating with direct dealer contracts and a multitude of factory-employed and supervised zone, district and regional managers. A majority of the middle and higher-priced lines continue to operate through distributors and many of them give every evidence of planning to continue such operations indefinitely. Even in these latter cases, however, definite increases have been and are being made in the number of factory-employed regional managers whose duty it is to supervise distributor and dealer activities in a given zone. The area per factory supervisor is constantly becoming less as the intensity of the competition increases.

All of this, of course, means increased factory sales cost, but also increased factory control of the merchandising function clear through to the consumer.

* * *

Marketing Activity Involves Numerous Intangibles

IN the production end of the business such centralized control, with each of the different departments operating closely under a single manufacturing head, unquestionably resulted in final economies as opposed to olden days, when individual department managers were, perhaps, less dominated by general company policies. Perhaps similar effective results may be said to have accrued, and may be expected to accrue in the future, from application of these same principles in the merchandising structure. The thought does occur to us, however, that the certainty of this idea might be open to question.

Merchandising activity is infinitely more widespread physically, for one thing, than is production activity. It involves, moreover, a greater number of psychological intangibles than does production and its technique as applied to modern and currently changing economic conditions seems to us to be far less settled than that of production fundamentals.

* * *

Centralized Supervision is Not Marketing Pressure

WHERE increased factory supervision means greater intensity in actual merchandising help for the distributor and dealer and not merely greater pressure to enforce current policies of expediency, that increased supervision would seem to be entirely in line with the basic needs arising out of the constantly intensifying competitive situation. Where added factory field men simply mean added pressure on wholesalers and retailers, on the other hand, there would seem to be a distinct possibility that the added men might be merely current expediencies rather than fundamental factors in the marketing scheme. The capacities of the field men themselves may be the deciding factor.

For this reason among others the adequate education and training of factory field men of all kinds probably is one of the two or three most acute problems before factory sales executives today. One chief sales executive expressed the problem aptly to us the other day when he remarked that "The problem of expansion of personnel is not one of the capacity of the individual organization to take on new men and new projects, but rather one of its ability to digest them quickly enough."

* * *

Favors Continuous Audit of S.A.E. Standards

ABOUT a month ago we printed a brief paragraph suggesting that "checking of the records on the more important S.A.E. standards would seem to us to be a good way of infusing new vigor into the job of keeping standards up to date and getting them into maximum use."

Since that time, one or two comments have come in supporting this view, among the most interesting of which is one from R. M. Hudson, assistant director of the Bureau of Standards. Mr. Hudson is an S.A.E. member, and seems strongly to favor "a continuous audit of adherence" to S.A.E. standards such as the Bureau of Standards regularly makes in connection with its commercial standards.

* * *

Standards Must Be Sold to Become Effective.

HEARING from Mr. Hudson on this subject recalls to mind a most able paper which he read before the American Engineering Standards Committee back in 1925 on the "Promotion of Standards." In that paper he says just about everything that we think on this subject, and says it in a far more orderly and comprehensive manner than we could hope to do. We recommend it to the study of all those interested in standardization work.

We content ourselves here with the quotation of two sentences with which we agree heartily: "If standards are not 'sold,' then there is little use in continuing to pile them up with the hope that eventually someone will use them. . . . An obligation, therefore, rests on standardizing bodies to work continuously for the widest possible adoption of the standards which they promulgate. If that obligation is not recognized—also, if action is not taken to fulfill it—then the responsibility for the failure of the proposed standard to become accepted practice rests primarily with the standardizing body and not with those for whose benefit the standard is developed."—N.G.S.

Wide Range of Topics Covered At Steel *Treating Convention*

Metallurgical technique employed in the early phases of automobile production is included in the comprehensive program of five-day assembly in Cleveland.

By P. M. HELDT

NO less than thirty-eight papers were on the program of the American Society for Steel Treating, technical sessions being held every morning and afternoon of the five days of the National Metal Congress Conclave in Cleveland last week. Morning sessions were held in the ball room of the Hotel Cleveland, where the Society had its official headquarters, while afternoon sessions were held in the meeting room of the Auditorium. The best attended meeting undoubtedly was that on Wednesday morning when Prof. Albert Sauveur of Harvard University delivered the Campbell memorial lecture, which dealt with steel at elevated temperatures. All available seats were occupied. The attendance was estimated at 600.

As far as possible, the program had been so arranged that papers on closely related subjects were presented at the same session. Thus the Monday morning session was devoted chiefly to carburizing and case-hardening, at the Wednesday afternoon session there were presented papers on what might be classified as metallurgical laboratory subjects, and two sessions on Friday were devoted to a symposium on the nitriding process of hardening steel. Abstracts of the papers of chief automotive interest follow.

Steel for Highly Stressed Gears

AT one session of the A.S.S.T. held in Cleveland last week, three papers relating to different phases of the case carburizing and quenching process were presented. One on "The Selection of Case-Hardening Steels for Highly Stressed Gears," by H. W. McQuaid and O. W. McMullen of the Timken-Detroit Axle Co. was read in abstract by Mr. McMullen.

The difference between oil-hardening and case-hardening steels for automotive gears was referred to, and it was stated that transmission gears for heavy-duty work (trucks and buses) are mostly made of case-hardening steels, and rear axle bevel gears and pinions are practically always made of such steels.

The advantages of case-hardening steels for this purpose are that they permit of easy machining and make it easy to obtain an extremely hard surface to resist wear, while at the same time they have excellent resistance to suddenly applied loads. Their disadvantages are that they are apt to distort considerably in heat treatment and that the treatment itself is expensive and sometimes difficult to control.

Case-hardening steels, the authors said, have a higher endurance limit than oil-hardening steels and should be preferred for that reason.

Alloy steels are always used for high duty automotive gears, the three most popular grades being Nos. 2315, 4615 and 6115. For specially severe duty, steel No. 2512, a 5 per cent nickel steel, is used.

William H. Eisenman, secretary of the American Society for Steel Treating, and general manager of the Eleventh Annual National Metal Exposition, held last week in the Cleveland Auditorium and Annex

Grain size is of importance from the standpoint of operation of the gear generators, and the authors recommended that after the grain size (in terms of the United Alloy Steel Co. chart), which gives the best results on the generators, had once been determined, that it be adhered to thereafter.

The authors recommended that ring gears be made from bar stock by upsetting, rather than from flat stock, in order to assure the best flow lines.

Case - hardening steel gear blanks must be normalized, and the operation of the generator will be much better if the normalizing is so carried out that the blanks have a Brinell hardness of 156-179, instead of 140-149. It has been found that the ball-bearing Gleason gear generator is much freer from chatter than the same machine with plain bearings, and will give a satisfactory finish with softer material.

In regard to the carburizing process, the authors said that the excess cementite in the case should be a minimum, since the temperature to which the steel is raised previous to quenching usually is not high enough to insure the throwing into solution of more than a small amount of excess cementite. This means that the carbon content of the case should be kept down, but this content is hard to control, and as a matter of fact most ring gear and pinion steels have a high carbon content in the case.

Ring gears are allowed to cool in the carburizing pot, are reheated to above the critical temperature of the case, and are quenched in oil by means of a quenching press. The procedure with pinions is the same except that they are reheated to above the critical temperature of the core and are quenched without the press. Both are tempered at about 300 deg. F. for a short time. In many plants, it is the custom to reheat pinions in a salt bath containing cyanide, and to quench in oil, this being claimed to result in greater hardness and cleanliness. With properly designed hardening dies, ring gears should come from the quench not more than 0.003 in. out of flat and out of round and at least 80 per cent of the gears should be not more than 0.0015 in. out of the flat and not more than 0.002 in. out of the round.

It is recommended to run test gears and pinions from each heat or from each lot machined, to determine the change in tooth bearing due to carburizing and heat treatment, and to base the generating of the rest of the gears from the heat on the results obtained.

In the second part of the paper, test results from a number of different case-hardening steels were given, including depth of case, range of Rockwell hardness of case, Brinell hardness of core, results of Izod impact test and transverse test with observation on the fractures obtained. Two sets of test specimens were machined up, viz., test bars $\frac{7}{8}$ in. in diameter and 10 in. long, and test rings of 2 in. outside and $1\frac{1}{4}$ in. inside diameter and with a rectangular section $\frac{1}{2}$ in. wide.

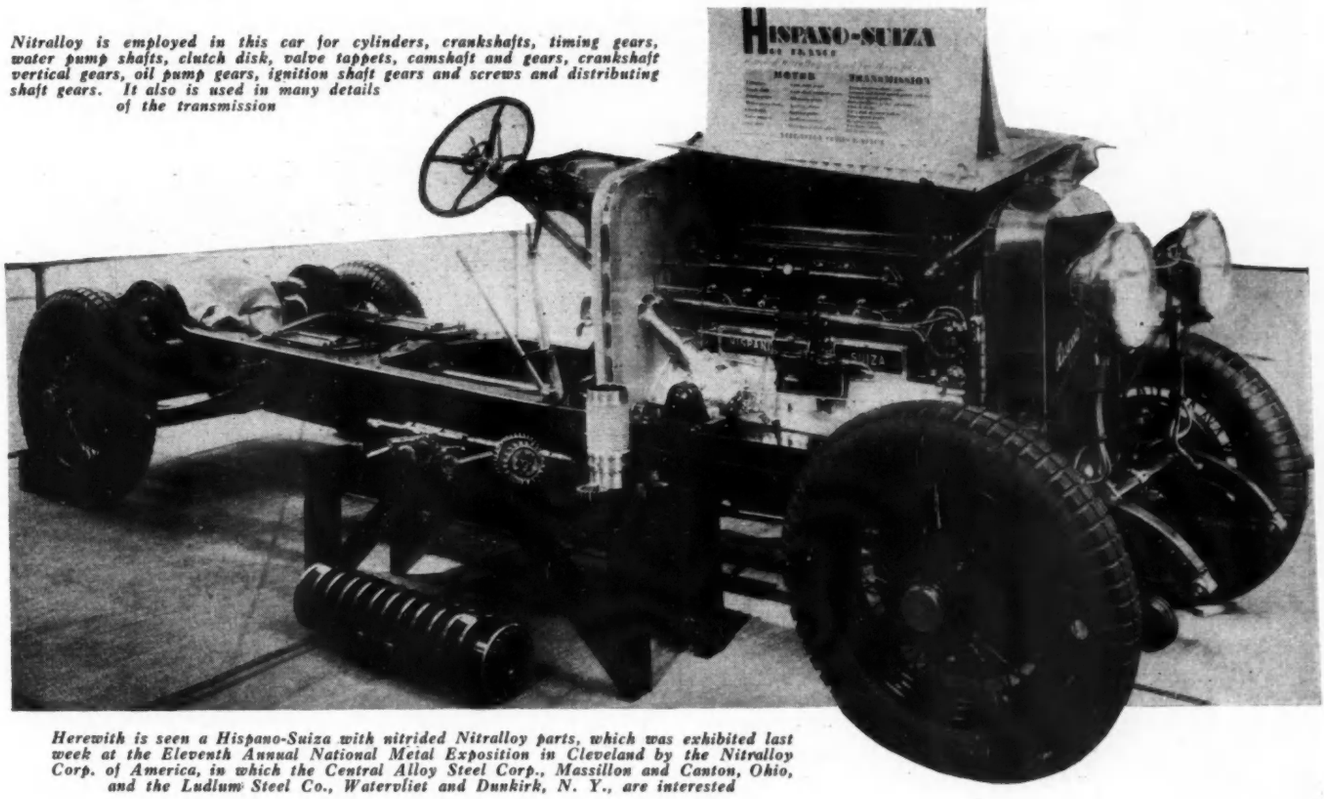
The results indicated that of steels tested, S.A.E. No. 4615 gives the hardest surface when oil quenched, which would indicate that this steel is well suited to resist wear in the case-hardened condition. The addition of nickel tends to lower the surface hardness obtained by oil quenching, and the 5 per cent nickel steel is low in this respect. The results also indicated that the prevailing impression that the surface hardness can be increased by heating carburized parts in a cyanide bath is erroneous. There is a decided decrease in surface hardness with an increase in the length of time the parts remain in the cyanide bath.

The view is expressed by the authors that the depth-hardness curve obtained by means of a Vickers diamond is extremely valuable, and that method of testing deserves to be more extensively used.

Such steels as the high manganese-molybdenum, which in the carburized condition have the Ar_1 point suppressed, show good hardness readings and may find important applications. A steel with 0.11 *C*, 3.17 *Mn.*, 0.015 *P*, 0.019 *S*, O.32 *Mo.* and 0.07 *Si.*, for instance, after carburizing and air-hardening showed not too high core hardness and a strength of case comparable with that of a 3.50 per cent nickel steel, which it exceeds greatly in core properties. The 3.5 per cent nickel molybdenum steels do not compare well with the standard carburizing steels in the air-cooled condition, while in the oil-quenched condition they compare well with 5 per cent nickel steel, and it is possible that this steel may be developed to compete with 5 per cent nickel steel for gear work. Apparently the structure of the core is of greater importance than its hardness, from the point of view of strength figures, and the higher carbon core,

A general view of that part of the Eleventh Annual National Metal Exposition which was housed last week in the Cleveland Auditorium. Another large part of the exposition was set up in the Annex to the Auditorium. The two structures are connected by an arcade, and together have a floor area of 80,000 sq. ft., which was fully occupied by the 275 exhibitors at the exposition

Nitralloy is employed in this car for cylinders, crankshafts, timing gears, water pump shafts, clutch disk, valve tappets, camshaft and gears, crankshaft vertical gears, oil pump gears, ignition shaft gears and screws and distributing shaft gears. It also is used in many details of the transmission



Herewith is seen a Hispano-Suiza with nitrided Nitralloy parts, which was exhibited last week at the Eleventh Annual National Metal Exposition in Cleveland by the Nitralloy Corp. of America, in which the Central Alloy Steel Corp., Massillon and Canton, Ohio, and the Ludlum Steel Co., Watervliet and Dunkirk, N. Y., are interested

possibly because it is easier to obtain uniform core structures with it, gives higher load readings.

Izod impact test values for steels quenched at above the critical range are the highest for nickel-molybdenum steels, particularly for the No. 4615 steel. This checks with practical experience, which has shown that in extremely severe service, such as in supercharger gears, this steel gives the best results.

Distortion was measured in all instances and it was found that while in some cases hardening increases the changes in dimensions due to carburizing, in others it reduces them. This point deserves particular consideration in connection with spiral bevel gears when changing from one steel to another or making a change in the heat treatment. From the standpoint of minimum change in tooth bearing, the air-cooled steels would be the most satisfactory.

The results of the tests are summarized briefly by saying that where high surface hardness and high resistance to impact are desired, together with good strength, S.A.E. No. 4615, single quenched from above the upper critical range of the core, gives the most satisfactory results. Where extremely high load carrying capacity and good impact resistance are desired, and extreme surface hardness is not necessary, S.A.E. No. 2512 offers the best combination of properties.

High alloy air-hardened steels offer interesting possibilities, chiefly in regard to simplicity of treatment.

Economical Re-use of Solid Carburizing Material

H. B. KNOWLTON in his paper on "The Economical Re-use of Solid Carburizing Material" said that in commercial case hardening with solid carburizing material it is the practice to use the same carburizing material over and over, adding a certain amount of new material after each run. If the production of case-hardened work remains constant, the real cost of the carbonizing material is proportional to the amount added after each run. In spite of the fact that this is a vital factor in the cost of carburizing, practice differs widely in different plants, from 10 to 30 per cent being added after each run. Some hardeners even change the carburizing material completely after each run on certain classes of work.

In experimental work extending over two years the author found it possible to decrease the addition after each run from 33 per cent (the proportion originally used) to 12 per cent without a change in the depth of case and the proportion of carbon in the different zones. The experimental carburizing was done in a modern automatic controlled counterflow furnace.

Additions of carburizing material are necessary to maintain the bulk and the carburizing activity of the material used. Losses in bulk are due to several causes besides the burning or decomposition during the carburizing process, viz., burning during direct quenching; burning after dumping, on the floor or in the bins, hoppers, etc.; removal of dust and fires are mechanically handled. Some of these losses can be eliminated or at least greatly reduced.

Some tests were conducted to determine the loss of weight of carburizing material during a run. With a charcoal base material, the loss was such that the addition of 10 per cent after each run should be sufficient to maintain a constant volume. Generally the proportional loss was greatest in the first run and decreased in successive runs. In a test with charcoal-coke-chemical compound carburizing material which was screened after each run, it was found that after the eighth run an addition of only 2 per cent of new material was necessary to maintain a constant volume.

These results were obtained in experimental work. When it was decided on the basis of these tests to reduce the addition of new material (the same as that used in the second series of tests) in routine work from 33 to

20 per cent, it was found that this was insufficient to maintain the volume, 25 per cent being necessary. Since only 2 per cent is lost through burning, it was evident that an excessive amount was lost through handling.

This led to the design and installation of new equipment for handling the carburizing material. Carburizing boxes are carried to and from the furnace by a slow conveyor. At the dumping station the temperature has become so low that there is no danger of the compound catching fire. A grid catches the work and allows the compound to pass throughout the handling system. The carburizing material is handled mechanically and as gently as possible. It never touches the floor. A definite and uniform mixture is assured. Dumping and packing stations are covered by exhaust hoods. The installation of this system reduced the amount of new carburizing material used per pound of work carburized by 50 per cent, and it has also improved the working conditions. The packing room is now cleaned and the packers work without respirators.

When loss due to handling is reduced to a minimum it is quite possible that loss of carburizing activity becomes the controlling factor. Commercial carburizing materials have a base of charcoal or coke or both, to which chemical "energizers," such as the carbonates of calcium, barium and sodium, are added. At the carburizing temperature these chemical energizers decompose and give off carbon dioxide which are coming in contact with large masses of hot granular carbon of the base material is converted to carbon monoxide, the active carburizing agent. When the carburizing material is allowed to cool, the chemicals absorb carbon dioxide from the air and are reconverted to carbonates.

Since charcoal burns more readily than coke, where a dual base is used the proportion of charcoal to coke decreases with use and must be restored. Some of the chemicals, such as cyamide, decompose partly during the first heat and are not regenerative. Carbonizing materials also become contaminated with sand, fire clay, iron scale, etc. Segregation of energizers may take place. The size of granules decreased with use, owing to burning away of surface layers; the specific gravity increases, and the material may possibly become so fine as to unduly restrict circulation of the carburizing gases in the container. As a rule, the resistance to heat flow of the material increases with use.

Carburizer Chemical Content

From some tests made with preshrunk wood charcoal and a chemical energizer composed of barium, sodium and calcium carbonates, the conclusion was drawn that with such carburizers the chemical content should never be allowed to fall below 2 per cent, and it would be safer to keep it above 5 per cent. The tests also show that the loose chemical should never be allowed to accumulate in the used compound, since segregations of loose chemicals produce poorly carburized areas.

In order to apply the results of the studies in routine work, Mr. Knowlton makes a periodic analysis of the mixed compound at the packing stations. The amount of carbonates present is quickly determined by the addition of sulphuric acid to a weighed amount of carburizing material. The volume of CO_2 involved indicates the amount of chemical if only a single one is present, but if the material contains several chemicals, their proportions must be known and equal relative losses must be assumed.

The proportion of new and old compounds is adjusted so that the content of chemicals never falls below 5 per cent. Test pins placed in the carburizing boxes daily show that the carburizing effect is uniform, but Mr. Knowlton expressed the opinion that the chemical test on the material before packing is a better safeguard than examination of test pins after carburizing.

High Strength Cast Irons

HIGH strength cast irons were discussed in a paper by E. J. Lowry of Detroit. In Europe, there are the outstanding Lanz Perlit process, which produces low-silicon-iron poured into heated molds; the Emmel process, by which low-carbon iron of high silicon content is produced; the Piworwarsky and Meyer processes of superheating cast iron; the Wuest process making use of an oil-fired melting furnace, and the Deschene process by which the molten metal is subjected to violent agitation. Many other processes have been developed in Europe without having found practical application, and even with the processes mentioned, there are limitations on large tonnage installations.

The outstanding developments in America were by the late George Ellicott, who investigated the influence of high temperatures in the production of high strength castings, and by David McLain, who developed the use of steel and cast iron mixtures. The International Nickel Co., along with the Electro-Metallurgical Corp., has developed the use of nickel and chromium in cast iron mixtures.

The production of high strength cast irons from the use of alloys has long been known, but to produce strengths of 60,000 and 65,000 lb. p. sq. in. has led to the use of special melting processes with the subsequent addition of alloys. Such methods have not generally been accepted by foundrymen.

It is often believed that the introduction of alloying elements into inferior iron yields high-strength cast iron, but such is not the case. An example in point is that of a cylinder head to the mixture for which alloying elements were added to reduce wear of the valve seats, but without success. In the drawings Figs. 1 and 2, the Brinell hardness at various points is indicated and the metal structure also is shown.

The chemical analyses of two different heads are listed below:

	Head A Per Cent	Head B Per Cent
Total Carbon	3.32	3.21
Graphitic Carbon	2.69	2.78
Combined Carbon	0.63	0.43
Manganese	0.66	0.58
Phosphorus	0.161	0.155
Sulphur	0.065	0.153
Silicon	2.33	2.51
Nickel	0.95	0.93
Chromium	0.01	0.06

The Brinell hardness in these heads averaged 179. The main difficulty in this casting was that it was being produced with too high a silicon content for the amount of core annealing space, with the result that on cooling, a zone of free ferrite was produced at all sections of the metal adjacent to the cores. This space gradually merges into a normal pearlitic structure in the metal away from the core spaces. It was not the fault of the alloys used but the combined effect of molding and analysis.

When alloys are properly used in connection with the correct section and analysis it becomes a fairly easy matter to produce high strengths without special processes. This means that when a foundryman has adjusted mixtures he can use regular cupola metal and with the addition of one of the known alloys in-

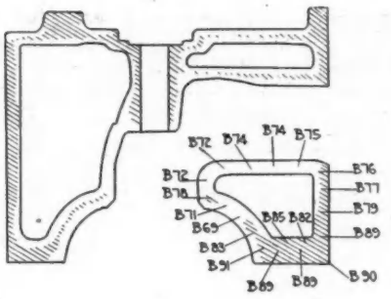


Fig. 1—Sketch of intake valve assembly showing Rockwell hardness values and Pearlite and Ferrite areas. Shaded portions are Pearlite

crease his average strength from 28,000 to 45,000 lb., and even as high as 65,000 lb. The known alloys are nickel, chromium, molybdenum, vanadium and titanium. These may be used singly or in varying combinations with each other. As an example, the following analyses are given:

	Chromium-Nickel Per Cent	Chromium-Molybdenum Per Cent
Total Carbon	3.34	3.42
Combined Carbon	0.62	0.54
Manganese	0.56	0.59
Silicon	2.49	2.49
Chromium	0.50	0.36
Nickel	1.07	...
Molybdenum	...	0.31
Sulphur	0.096	0.075
Phosphorus	0.142	0.135

The above irons were cast on the same day with the same metal mixture, the only difference being in the ladle alloy addition. The following strengths were obtained:

	Chromium-Nickel	Chromium-Molybdenum
Transverse Strength	3366-2852	3151-3365
Deflection	0.112-0.100	0.110-0.118
Tensile Strength	33,203-33,313	32,686-32,994
Brinell Hardness	217-223	207-217
Depth of Chill	5/32-3/16	7/32-¼
Brinell Hardness (on head of cylinder)	187 to 207	202 to 217
Brinell Hardness (on cylinder bore)	174 to 179	187 to 192

Vanadium has come into considerable play in the production of automotive forming dies. This alloy is used in the range of about 0.15 per cent, with nickel, chromium and molybdenum in small percentages. The effect of this combination is to give increased wearing qualities combined with high strength and excellent machinability.

There are still further possibilities connected with high strength irons when annealing is considered to improve the machinability. This is well illustrated by the following test results:

	Regular Iron Per Cent	High Strength Iron Per Cent
Total Carbon	3.30	3.35
Combined Carbon	0.42	0.64
Manganese	0.63	0.55
Silicon	2.26	1.70
Chromium	0.08	0.63
Nickel	0.21	1.46
Molybdenum	...	0.75
Phosphorus	0.231	0.206
Sulphur	0.104	0.064

The resulting physical properties are listed below:

	Regular Iron as Cast	High Strength as Cast	High Strength Annealed
Transverse Strength (lb.)	3,099	5,459	
Deflection (inches)	0.105	0.155	
Brinell Hardness	207	321	321
Tensile Strength (lb. per sq. in.)	25,308	46,039	42,850

A study of the above physical properties shows that the tensile and transverse strength of the high strength cast iron is about 75 per cent greater than the regular

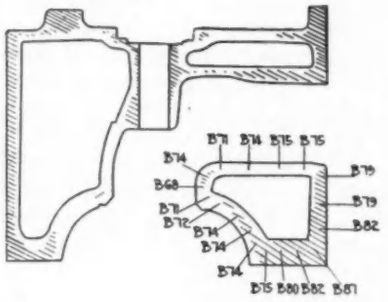


Fig. 2—Sketch of exhaust valve assembly showing Rockwell hardness values and Pearlite and Ferrite areas. Shaded portions are Pearlite

iron. Deflection and hardness are about 50 per cent greater, while the structure of the high strength iron is sorbitic with a tendency toward some martensite. Annealing it at 950 deg. Fahr. for four hours with subsequent furnace cooling reduces the martensite to sorbite and some of the sorbite to pearlite, thus giving comparable machinability. Undoubtedly if the regular iron was annealed to relieve strains there would be a slight difference in the machinability of these types of irons and in favor of the regular iron.

Symposium on Nitriding Process

ON the last day of the Metals Congress a symposium on the subject of nitriding was held before the A.S.S.T. and additional interest was lent to the sessions by the presence of Dr. Adolph Fry, the inventor of the nitriding process, and Mons. A. Aubert, a French steel maker, who secured exclusive rights under the process outside of Germany and introduced it in this country. No less than seven different papers were presented on the subject, including one by Dr. Fry, who summarized his conclusions under two heads, viz., things which are definitely known about nitriding, and things regarding which there is still some doubt and difference of opinion. Other papers were as follows: Observations upon the Iron-Nitrogen System, by Samuel Epstein of the Illinois Steel Company; A Study of the Nitriding Process, by Dr. V. O. Homerberg and Dr. Walsted of Massachusetts Institute of Technology; Researches on Nitriding Steels, by Dr. O. E. Harder, J. T. Gow and L. A. Willey of the University of Minnesota; Investigations in Nitriding, by Robert Sergeson of the Central Alloy Steel Corporation, Canton, Ohio; Short-Time Nitriding of Steels in Molten Cyanides, by Dr. A. B. Kinzel of the Union Carbide & Carbon Research Laboratories, and A Few Practical Fundamentals of the Nitriding Process, by H. W. McQuaid and W. J. Ketcham of the Timken-Detroit Axle Company.

Dr. Harder and his associates had made a general investigation of steels with respect to their suitability for nitriding, and after this general survey had confined their experiments to the steels which were found to be most suitable for this process. In one of the

papers it was brought out that when a piece of steel is nitrided it increases very slightly in dimensions. A cylinder, for instance, will increase very slightly in diameter—one-half of one-thousandth of an inch—and the case will also increase in length. The result of this latter change is that a sort of ridge will be thrown up at the ends of the cylindrical surface which is very apt to chip. For this reason it is essential to eliminate sharp edges as far as possible from work that is to be nitrided.

It was generally agreed that nitriding gives a case of greater hardness than can be obtained by any other process, and that it does not distort parts to an appreciable degree. If the process is properly carried out the core material is not changed. Nitrided parts are said to be entirely free from internal stresses. The best results are obtained by quenching and tampering, machining and nitriding parts in succession.

Mr. McQuaid, who discussed the nitriding process from the standpoint of the user, made the statement that it was generally agreed that some material better than case-hardened steel was needed, and he thought that nitrided steel would meet the requirements. Its advantages were that the parts were very hard, had great resistance to corrosion, did not distort and had a high impact value. On the other hand, the material cost from 7 to 12 cents per lb., as compared with 3½ cents per lb. for carburizing steel. The machining qualities of the steel as compared with S.A.E. steels 4615 and 2315 were also an important consideration.

It was pointed out by one of the speakers that surfaces that are not to be nitrided can be protected by nickel plating or by tinning. Attention was also called to the fact that the current of ammonia gas which is passed through the nitriding chamber is partly decomposed into hydrogen and nitrogen. It is the nitrogen which produces the hardening effect, while the hydrogen has unfavorable effects on the steel. One speaker mentioned packing the parts in tantalum, which has great absorbing capacity for hydrogen, to eliminate this effect. When tinning parts to inhibit the nitriding of certain surfaces, it is essential to remove all surplus tin, as a very thin layer will prevent all penetration of nitrogen, and surplus tin may drop off and onto other parts in the lower part of the chamber, causing soft spots.

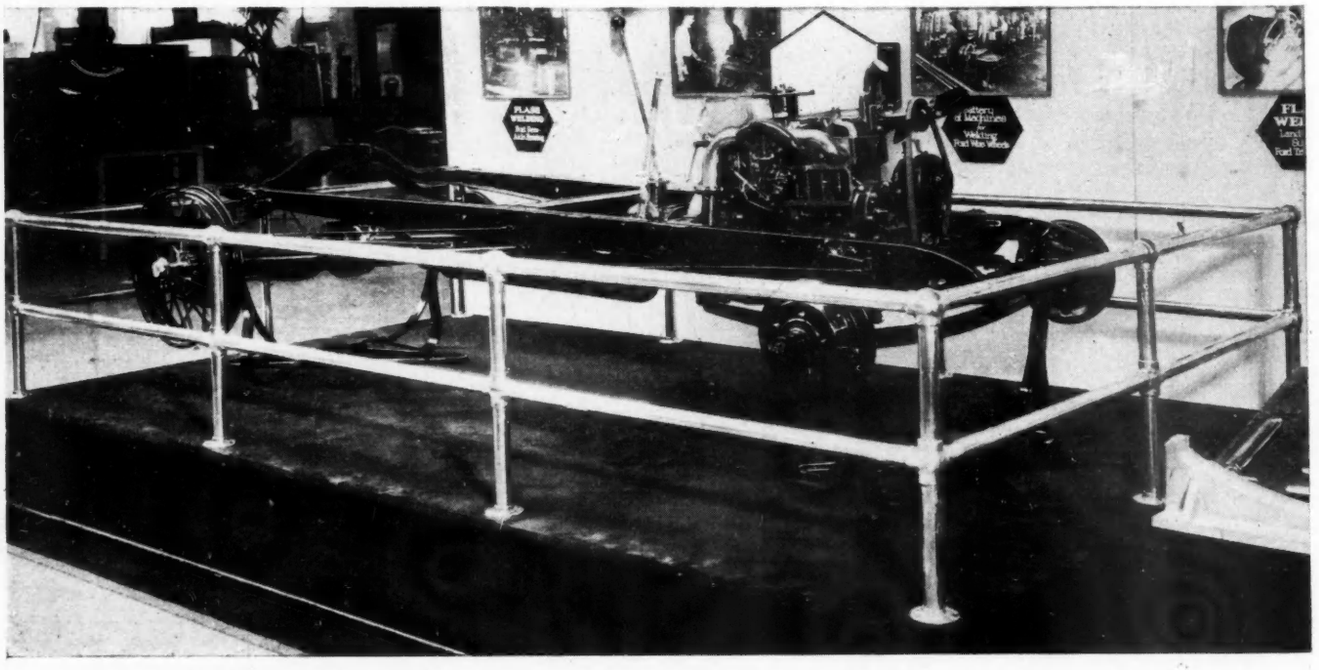
Recently considerable attention has been given to a so-called duplex cycle, in which the parts are nitrided at high temperature for a short period and then at lower temperature for the rest of the time, the main object being to reduce the cost of the process, which ordinarily takes 90 hours.

As the temperature of the nitriding chamber is increased and the rate of flow of ammonia through it is decreased a greater proportion of the ammonia is dissociated. In experimental work the temperature was carried above 1400 deg. Fahr., but it was found that the best results were obtained at about 1000 deg. Fahr. and when only a small proportion of the ammonia is dissociated. The hope was expressed that it would be found practicable in large installations to recover the undissociated ammonia.

Dr. Homerberg announced that a nitriding committee had been formed to supervise further research work in connection with the process and thereby eliminate overlapping of effort. The papers of the symposium are to be published in book form within the near future.

Blistering During Processing

Dr. Anson Hayes, chief chemist of the American Rolling Mill Co. of Middletown, Ohio, said in a discussion at the meeting that observations indicate that the fundamental cause of blistering of various metals during processing is that bases collect in voids or laminations, and that the pressures required to cause blistering in such defects can be rather easily calculated. A paper presented by him at one of the sessions of the A.S.S.8. deal with the conditions necessary for blistering of ferrous materials, particularly in the annealing and pickling of sheet metal.



This is one of the many Ford Model A chassis on which Elkonite was used for 95 per cent of the 1339 welds. This chassis was exhibited at the Eleventh Annual National Metal Exposition, held in Cleveland last week, by Elkon, Inc., a division of P. R. Mallory & Co., Inc.

Eleventh National Metal Exposition Abounds With *Automotive Interest*

Exhibits of high-speed cutting alloys, stainless and nitrided steels are especially attractive to visitors from the motor car industry. Attendance is large.

THE Eleventh Annual National Metal Exposition which was held last week in the Public Auditorium and Annex in Cleveland was fully up to the high mark set by the shows of previous years. The exposition was well staged and well managed, and public interest was keen. In fact, the writer does not remember a single previous exhibition of strictly industrial goods, that is, of articles other than those for family consumption, to which the general public flocked in such large numbers.

During the several evenings the show was open, the scene it presented was very much reminiscent of automobile shows in the large cities, there being continuous processions up and down the aisles, and large crowds collecting around stands at which demonstrations were being given or which contained exhibits of particular appeal.

Aircraft Parts Favored

The show was supported by three important industries. The principal one was the steel industry, and most of the steel works had stands at which they exhibited machines and parts made of their steels, test specimens and other evidences of the qualities of their products. Aircraft parts have become favorite exhibition material with steel makers. Crankshafts and connecting rods in the finished state were shown at quite a number of stands. Aircraft work, of course, calls for steels of the highest quality, and besides, the completely finished parts of aircraft engines make rather attractive exhibits.

The second industry taking a major part in the exposition was that of heat-treating equipment. Its products included furnaces of various kinds, refractories, heat-resisting metals and various articles made therefrom and used in heat-treating operations; temperature-control equipment, metallographic and mechanical testing equipment, carbonizing and quenching materials.

The third participating industry was that of welding machines and welding equipment and materials. Many of the furnaces and welding machines were shown in operation, and gas-cutting was also demonstrated. All of this equipment was located in the Annex, a large single-story building connecting with the Auditorium by a corridor.

Points of particular automotive interest at the show were exhibits of the new super high-speed cutting alloys of stainless or non-rusting steels, and of nitrided steels.

Turning operations with tools of the super-speed cutting alloys were performed more or less continuously at two stands. At each stand a blackboard was displayed, on which were shown the cutting speed, depth of cut, rate of feed and material being cut, and the rates at which metal was being removed from the work was certainly very impressive. The two cutting alloys that were thus demonstrated were Carboloy and Widia.

Stainless steel products were exhibited by a number of firms. This material recently has found application in the automobile industry for such parts as hub caps, fuel tank caps, hood hinges, etc., but the articles featured at the stands were for the most part highly ornamented house and kitchen utensils.

Applications of the nitriding process were staged very effectively in the wide corridor connecting the two buildings, where a Hispano-Suiza polished show chassis was exhibited, with all nitrided parts marked.

There was probably more testing equipment exhibited than at any previous metals exposition. The hardness test is constantly gaining in favor, both because it can be made very rapidly and because it is a non-destructive test, and several new machines for applying it were shown.

Machine Tools Limited

Machine tools were shown only to a very limited extent. Most of the tools were of the type used in the first operations on iron and steel units as they come from the rolling mill, the forge or the foundry, such as power hacksaws, shears, suaggers and portable grinders, chippers, etc. Tool room machines, such as die sinkers and milling machines, also figured among the exhibits, several of the tools shown being of foreign manufacture.

A large space in the Annex was occupied by a collective exhibit of the American Gas Association. One of the exhibits there was a Nash automobile powerplant which was being run on coal gas, the explanation being given that Nash uses this fuel for running in engines. Gas-fired furnaces of various types were being shown, and some of these were equipped with an automatic regulator of a new type.

Since the automotive industry is the largest industrial consumer of steel and probably also employs heat-treating and machine welding more than any other industry, there was something of automotive interest at nearly every stand in the exposition.

First with the News

Reliable, Accurate

News of the Industry

PAGE 424 VOLUME 61 *Philadelphia, Saturday, September 21, 1929* NUMBER 12

Recession Is Faced As Car Stocks Continue to Mount

PHILADELPHIA, Sept. 19 — Car stocks continue to be a major problem with manufacturers. Dealer passenger stocks showed a sharp increase from August, 1928, to August, 1929. In the face of this and considering the fact that low-priced automobile manufacturers, notably Ford and Chevrolet, have indicated continued heavy production, sharp curtailment can be expected in the industry unless the estimate of 5,500,000 units for the year is exceeded.

Thus far September production has held up, factory executives report. The totals are slightly higher than those for the first two weeks of last month, it is reported from Detroit.

Therefore, any recession of production would become effective soon unless it were to take the form of a complete shut-down in several factories.

Ford's output for the first eight months was 1,472,386 cars and trucks, representing approximately 33 per cent of the output of the entire industry. Thus it would seem that if this ratio of the entire output should continue, and if Ford plans to continue the present level of production, namely, about 200,000 units a month, plus Chevrolet's contemplated production, the last four months will see the 5,500,000 figure reached without the aid of other manufacturers.

Total August production of passenger cars and trucks in the United States and Canada was 513,843, according to figures compiled by the Department of Commerce from reports of 148 manufacturing concerns in this country and the Dominion bureau of statistics. August production compares with the output of 492,543 for the same month of 1928 and with a production of 517,854 units for the preceding month of this year. Passenger car production during August numbers 455,748 and truck production 58,095. Production for the first eight months of this year was 4,443,450 units, compared with 3,236,364 for the similar period of last year, a difference of 1,207,086.

Rules Against Bus Exhaust Heaters

ALBANY, N. Y., Sept. 18—The Public Service Commission has barred exhaust heating systems, effective Dec. 1, on old buses. The rule will become effective for new bus installation Jan. 1, 1930, according to F. E. Roberts, secretary of the New York commission.

Guggenheim Named Cuban Ambassador

WASHINGTON, Sept. 16 — Harry F. Guggenheim has been named by President Hoover as Ambassador to Cuba in place of Noble Brandon Judah, of Chicago, who recently resigned.

He has become one of the leading supporters of American aviation as president of the Guggenheim Fund for the Promotion of Aeronautics.

Last year he was awarded the gold medal of the American arbitration association for distinguished service in the promotion of peace.

R.C.A. Says General Motors Discussing Radio Making

NEW YORK, Sept. 17—Discussions are being held between General Motors Corp. and the Radio Corp. of America in connection with entering into a licensing agreement for the manufacture of radio receiving sets by General Motors under R.C.A. patents, according to David Sarnoff, president of the latter company.

This statement was issued in order to set at rest the uneasiness which had arisen among radio dealers from the rumor that the two corporations were entering into an agreement for the distribution of R.C.A. products through General Motor dealers.

Breaks Speed Record Again

CALSHOT, ENGLAND, Sept. 12—The world's air-speed record was raised today to 357.7 miles an hour by Squadron Leader Orlebar, captain of the British Schneider Cup team.

Airline Patronage Key to Aero Gain

Chamber of Commerce Hears Executives Discuss Future of Aviation

KANSAS CITY, Sept. 16—Officials of 29 leading air transport companies met here today with more than a hundred technical and commercial experts in their field for the first national air traffic conference of the Aeronautical Chamber of Commerce.

Frederick B. Rentschler, president of the United Aircraft & Transport Corp. and of the Pratt & Whitney Aircraft Co., who is president of the chamber, expressed the belief that the prosperity of the aeronautical industry depended upon the development of more patronage for air transport.

Colonel Halsey Dunwoody, executive vice-president of the Universal Corp., spoke to the delegates at a luncheon and warned them against permitting over-enthusiasm to impair their judgment. "Our greatest need at the present time, while keeping our eyes and ourselves in the heavens, is to keep our feet on the ground," he said.

"In order to produce dividends, air transport lines must pay. We air transport operators, consequently, are face to face with certain very definite needs, which may be enumerated as public confidence, increased patronage, constantly improving service and practical organization."

G.M. Buys North East

NEW YORK, Sept. 19—Officials of General Motors Corp. today announced that the company had purchased the North East Electric Co., Rochester, N. Y., by an exchange of stocks. *(Other details on page 427 of this issue.)*

Expects Continued Prosperity

DETROIT, Sept. 16—"American motor manufacturers can look forward to continued prosperity as far as Great Britain and Continental Europe are concerned," said Courtney Johnson, general sales manager and a director of the Hudson Motor Car Co., who has just returned from an extended tour of those countries.

Names Automotive Men on Committee

Secretary Lamont's New Traffic Group Will Meet in Washington

WASHINGTON, Sept. 19—Secretary of Commerce Lamont this week appointed a committee on relief of traffic congestion in connection with the safety program being conducted by the National Conference on Street and Highway Safety.

The committee, which includes in its membership several men well-known in the automotive industry, will hold its organization meeting at the Commerce Department on Oct. 10. Among those named on the committee are:

E. J. Mehren, vice-president, McGraw-Hill Publishing Co., chairman; Norman Damon, National Automobile Chamber of Commerce, secretary; Owen B. Augspurger, New York Automobile Club; Lee J. Eastman, vice-president, Packard Motor Co.; D. C. Fenner, Mack International Truck Corp.; Arthur M. Hill, vice-president, Charleston (W. Va.), Interurban Automobile Association; Paul G. Hoffman, vice-president, Studebaker Corp. of America, and William M. Nevin, Nevin Bus Lines, New York.

The committee includes representatives of state highway departments, fire departments, automobile dealers and manufacturers, civic organizations and railroad and bus companies.

The appointments were recommended by Colonel A. B. Barber, director, National Conference on Street and Highway Safety and will be the third group to begin a study of nation-wide traffic problems.

Eaton Group Strengthens Position in Steel Field

CLEVELAND, Sept. 18—With the purchase of the Donner Steel Co., Inc., Buffalo, Cyrus S. Eaton, a partner in the financial firm of Otis & Co., and his associates have become one of the strongest factors in the steel, automotive parts and fabricating industry in the country.

The Donner concern purchased the plants and business of the New York State Steel Co. in 1915. It operates two complete blast furnaces, nine open-hearth furnaces and extensive mill equipment. In August the company bought additional land valued at around $2,000,000. The Eaton group also controls the Republic Iron & Steel Co., and the Trumbull Steel Co., Steel & Tubes, Inc., subsidiaries, as well as extensive mining operations.

De Palma Works on Supercharger

PHILADELPHIA, Sept. 19—Ralph De Palma, dean of American automobile racers, is completing work on a supercharger of his own design at the Naval aircraft factory here. The new supercharger is light in weight and designed primarily for use on airplane engines.

Aviatrix is First Airplane Saleslady

NEW YORK, Sept. 17—Fay Gillis, who became one of the few women members of the Caterpillar Club when she jumped from an airplane which had lost its tail, today became the first airplane saleswoman, according to an announcement by "Casey" Jones, president of the Curtiss Flying Service.

Packard Announces Prices

DETROIT, Sept. 18—Packard Motor Car Co. has announced prices of its new 1930 series. This series is equipped with four-speed transmission and slightly lower ratio of the rear axle. Prices follow:

	U. S. Price	Canadian Price
Model 726—Standard Eight		
Sedan, 5 pass	$2,375	$3,310
Model 733—Standard Eight		
Club sedan, 5 pass.	$2,675	$3,735
Conv. coupe, 2-4 pass.	2,550	3,560
Coupe, 5 pass.	2,675	3,735
Phaeton, 4 pass.	2,425	3,380
Roadster, 2-4 pass.	2,425	3,380
Sedan, 7 pass.	2,675	3,735
Sedan-lim., 7 pass.	2,775	3,380
Sport phaeton, 4 pass.	2,725	3,810
Touring, 7 pass.	2,525	3,520
Model 740—Custom Eight		
Club sedan, 5 pass.	$3,750	$5,270
Conv. coupe, 2-4 pass.	3,350	4,700
Coupe, 2-4 pass.	3,295	4,620
Coupe, 5 pass.	3,650	5,125
Phaeton, 4 pass.	3,190	4,470
Roadster, 2-4 pass.	3,190	4,470
Sedan, 5 pass.	3,585	5,035
Sedan, 7 pass.	3,785	5,320
Sedan-lim., 7 pass.	3,885	5,460
Sport phaeton, 4 pass.	3,490	4,900
Touring, 7 pass.	3,325	4,660
Model 745—De Luxe Eight		
Club sedan, 5 pass.	$5,150	$7,270
Conv. coupe, 2-4 pass.	4,885	6,890
Coupe, 2-4 pass.	4,785	6,745
Coupe, 5 pass.	5,100	7,195
Phaeton, 4 pass.	4,585	6,460
Roadster, 2-4 pass.	4,585	6,460
Sedan, 5 pass.	4,985	7,030
Sedan, 7 pass.	5,185	7,320
Sedan-lim., 7 pass.	5,350	7,555
Sport phaeton, 4 pass.	4,885	6,890
Touring, 7 pass.	4,585	6,460

Auto-Lite Earns $1,408,500

TOLEDO, Sept. 16—The Electric Auto-Lite Co. will distribute $1,408,500 of earnings in quarterly dividend to its shareholders on Oct. 1, it was announced here following the directors' meeting. The dividends include $1.50 a share on common and $1.75 a share on preferred payable Oct. 1 to holders of record Sept. 24.

Toledo Employment Gains

TOLEDO, Sept. 16—Employment in Toledo automotive plants has been on the upturn the last two weeks but is not quite up to last year's level. Fifty-one plants here reported 31,751 at work at the end of last week, compared with 34,269 a year ago.

Treaty is Hurried to Help Industry

Pact Abolishing Restrictions on Imports and Exports is Before Senate

WASHINGTON, Sept. 18—The Senate Foreign Relations Committee today reported favorably to the Senate the treaty providing for international abolition of import and export prohibitions and restrictions, which would aid American automobile manufacturers in the development of world trade.

This protocol, approved by 29 nations, has been slumbering in the files of the committee since Jan. 3.

Senator Vandenburg of Michigan, today dug the treaty out of the committee files and had it reopened.

Under the provisions of the treaty, notice of ratification by this government must be registered at Geneva on or before Sept. 30. It is expected that the Senate will pause in its debate on the Hawley-Smoot tariff bill long enough to ratify the convention within the next few days. The convention would abolish the systems of prohibition and restrictions in force in a considerable number of countries which arbitrarily limit the markets for American goods, including automobiles. Under these systems, it is charged by the National Automobile Chamber of Commerce, American trade has in some instances been more seriously restricted in fact than has that of competing countries.

Rolls-Royce Announces Changes in New Model

LONDON, Sept. 18 (*Special*)—Rolls-Royce, Ltd., today announced extensive alterations in its 40-50 chassis, which it will market as a new model. The six-cylinder engine is of the same general design but has the four-speed gearset. The bore and stroke are unchanged, but a greater output is obtained, giving increased maximum car speed and better acceleration. Fuel feed is by vacuum pump. Battery and magneto ignition is provided.

Continues Ford Taxi Fight

PHILADELPHIA, Sept. 18—The Universal Cab Co., a group of Ford dealers, continued today its fight before the Public Service Commission, to give Philadelphia cheaper cab service.

Robinson Heads Aircraft Sales

DETROIT, Sept. 17—The appointment of L. J. Robinson as general sales manager of the Detroit Aircraft Corp. was announced today by Edward S. Evans, president. Mr. Robinson during the war was on the staff of Major General James E. Fechet, present chief of the Army Air Service.

Gemmer Declares Dividend

DETROIT, Sept. 18—The Gemmer Mfg. Co. has declared its quarterly dividend of 75 cents on Class A stock, payable Oct. 1 to stock of record Sept. 24.

Men of the Industry and What They Are Doing

General Motors Export Executives in Meeting

A. F. Bassett, managing director of General Motors Brazil, who was in this country attending the recent managing directors' conference of General Motors Export Division, followed this meeting by a vacation. He returned to his post aboard the S.S. Pan American.

P. E. West, managing director of General Motors Uruguay, who also spent the time since the managing directors' conference taking a vacation, sailed for Europe on the S.S. Minnetonka Sept. 14, to visit European operations of the export company before returning to Montevideo. E. A. Callanan, regional sales manager for Europe, arrived in New York on the S.S. Majestic to attend the regional sales managers' conference.

Hyatt Promotes Meister

H. O. K. Meister, general sales manager of the Hyatt Roller Bearing Co., Newark, N. J., since 1925, has been appointed assistant general manager, effective Sept. 1. He was formerly assistant general sales manager and prior to that he was manager of their western division in Chicago. He has been associated with Hyatt for over 15 years. Through his activities in S.A.E. work he is well-known to the automotive industry.

Representative Plans U. S. Visit

Paul W. Ornstein, for about 25 years head of the Continental European sales organization of the Guiterman Co., Inc., will visit America in October. He will be open to take on a few new lines, and it is suggested that automotive parts and accessories manufacturers who are looking for live representation in Continental Europe communicate with Mr. Ornstein through Guiterman Co., Inc., 35 S. William St., New York.

Rose Heads U. S. Rubber Department

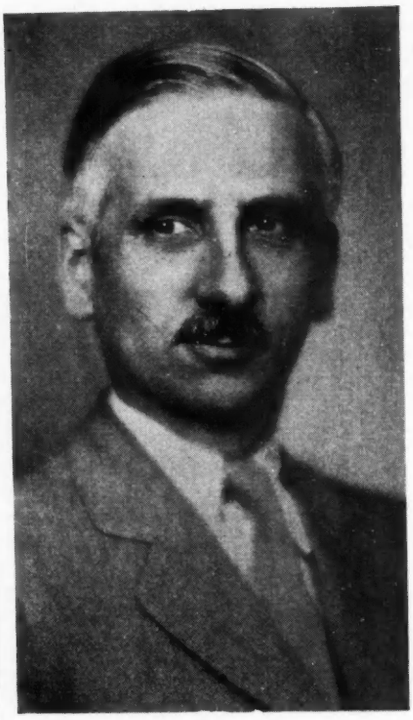
R. P. Rose has been appointed general manager of the United States Rubber Co. fiber products department, according to F. B. Davis, Jr., president and chairman of the board. This department, with headquarters in New York, will operate in Cleveland, Ohio, and Rock City Falls, N. Y., to manufacture unwoven fiber products containing rubber from natural or artificial latex.

Thompson Makes Promotions

E. A. McBride has been named factory manager of Thompson Products, Inc., Cleveland. Harry Bubb has been appointed chief metallurgist. J. M. Kerwin will assume McBride's duties.

Scott is C. I. T. Vice-President

Rumsey W. Scott has joined Commercial Investment Trust Inc. as a vice-president.



Dr. James H. Greene

whose appointment as manager of the cooperative department of Studebaker Corp. was announced last week in *Automotive Industries*

Capt. Irving with Hillman

Capt. J. S. Irving, designer of the "Golden Arrow," in which Major Sir Henry Segrave set the world speed record at 231.36 m.p.h. in Florida last March, has been named technical director of the newly organized merger of Hillman-Humber-Commer interests in England.

Captain Irving was for some years associated with the Sunbeam Motor Co. as chief designer and was responsible for the production of the 1000 hp. two-engined Sunbeam on which Segrave's first world's record of over 200 m.p.h. was secured. He is considered one of the ablest designers of today in England.

Sir Henry Segrave has also become associated with the Hillman concern, and among the new models introduced today is a four-passenger coupe known as the "Segrave" model, offered with the 14 hp. four-cylinder chassis and the 20 hp. straight-eight.

Kelly is Bank Director

Dan Kelly, executive vice-president of the Electric Auto-Lite Co. and former head of the U.S.L. Battery Corp., has been elected a director of the Security Savings Bank & Trust Co., a $25,000,000 financial institution at Toledo.

King Gustave V Plans to Decorate Vincent Bendix

Vincent Bendix, head of the Bendix Aviation Corp., is on his way to Sweden to answer a summons of King Gustave V, who will bestow upon him the title of Knight of the North Star. Mr. Bendix has done much philanthropic work in Sweden. Accompanying Mr. Bendix are Charles Marcus, president of the Eclipse Aviation Corp., and W. L. O'Neill, president of the Stromberg Carburetor Corp. They plan to consolidate activities of the Bendix Aviation Corp. in Europe.

Hupp Reelects Directors

Moritz Rosenthal, New York, and Robert G. Schaffner and Hiram J. Halle, Chicago, were reelected members of the board of directors of the Hupp Motor Car Corp. at the annual meeting of the company Sept. 11 at Richmond, Va. The board is to meet in Detroit on Sept. 12 to elect officers of the company.

Herman Retires From Gillette

F. C. Herman, who reorganized the Gillette Rubber Co., Eau Claire, Wis., and served as its president for the past six years, has retired and is succeeded by Ralph W. Hutchins, who has been vice-president and factory manager under the Herman regime. Sumner G. Moon has been elected vice-president; I. T. Gilruth, vice-president and general counsel; C. B. Reynolds, secretary and treasurer; H. C. Olson, assistant secretary and treasurer. R. B. Gillette, founder of the company, continues as chairman of the board.

Mendler Heads Studebaker Parts

E. C. Mendler heads the reorganized parts department of the Studebaker Corp. at South Bend, Ind. About 40,000 parts are carried for passenger and commercial cars and buses of all models now being operated and 350 persons are employed in this department.

Jordan Executives to Sail

John McArdle, vice-president and general manager of the Jordan Motor Car Co., and C. A. Glentworth, export manager, are sailing this month to attend the Paris and London automobile shows, where a complete line of Jordan cars is being exhibited.

Oakland Promotes Brown

R. P. Brown has been named assistant advertising manager of the Oakland Motor Car Co. Previous to his affiliation with Oakland, where he has served the last three years as a member of the advertising staff, Mr. Brown was connected with the C. C. Winningham, Inc., Agency, Detroit Range Boiler and Steel Barrel Co., and Walker & Co., outdoor advertisers of Detroit.

Dedicate Seaplane Port at Port Washington, L. I.

NEW YORK, Sept. 16—The American Aeronautical Corp. dedicated its new seaplane airport at Port Washington, L. I., last Saturday in the presence of about 1500 guests including many prominent figures in aviation. This airport which will be used exclusively for seaplanes is adjacent to the plant which the company is erecting at Port Washington. The dedicatory exercises were opened by Enea Bossi, president of the corporation, who spoke of the dreams and aspirations which were being realized in this opening.

Other speakers on the program included Edward P. Warner, former assistant secretary of the navy for aeronautics, who stressed the need for a greater development in seaplanes parallel to the development which has been taking place in land planes. William P. MacCracken, assistant secretary of commerce for aviation, also spoke and mentioned the importance of having a seaplane base near large cities where planes which could land on the adjacent waters could be stored and secure service. The actual dedication was made by Colonel Benjamin F. Castle of the Great Lakes Aircraft Corp., which is one of the companies affiliated with the American Aeronautical Corp., through the holding company, Allied Motor Industries, Inc.

Hillman to Offer Eight

LONDON, Sept. 18 (*Special*)—The Hillman Motor Co., London, will offer a straight-eight sedan at £445, which is £40 less than the lowest-priced closed car on the Eight hitherto, it was announced. This lower figure is due to the omission of safety glass, servo braking and certain other special features of the higher priced sedan, which is termed the "Safety" model and is again £485. A Weymann fabric sedan is also £485. Sliding roofs are offered at £10 extra. On all cars chrome plating is now used, not only for the exterior but also for the interior parts.

Here it may be added that unless some manufacturer springs a surprise at a later date, it is highly improbable that the list of British straight-eights will be lengthened this year, though Alvis is standardizing the front-drive sports model with an eight-cylinder engine that has been developed and used during the past 12 months for racing.

Another Ford Plant on Five-Day Week

DETROIT, Sept. 16—The Ford Motor Co. River Rouge plant has been definitely placed on a five-day week operating basis with the exception of the electric furnace and the cement plant, officials of the company said today. Ford officials said there had been no lay-off of men.

North East Merger Plans Are Up to Stockholders

ROCHESTER, N. Y., Sept. 19—Plans for the merger of the North East Electric Co. with one of the largest concerns in the industry is scheduled to be presented to stockholders for their approval today, President William A. Montgomery announced.

Although Mr. Montgomery would not reveal the name of the second party to the merger, it was understood in financial circles here that the concern was the Chrysler Motor Corp. Dodge Brothers, Inc., now a subsidiary of Chrysler, has long been one of the major customers of North East and it was recalled that Walter P. Chrysler was here only a few months ago, ostensibly to discuss terms of the merger.

Mr. Montgomery said "the proposed sale is for effecting a merger with a larger corporation having abundant capital and resources. It has already met with the full approval of the board of directors. It is contemplated that the business will remain in Rochester and be expanded and that the present management and organization will continue."

Miniger-Lint Group Forms Forge Company

TOLEDO, Sept. 16—The City Forge Co., chartered under Ohio laws with 1000 shares of no par common stock, has been formed by the City Machine & Tool Co., controlled by the Miniger-Lint group, to take over the forge business of the S. M. Jones Co. The consideration was approximately $250,000. The acquisition will assure the tool company of an ample supply of die forgings. It has about 100 customers on its books and nets about $50,000 annually so that it is anticipated with development of its business it will add materially to earnings of City Machine & Tool Co.

Amos Lint is president and general manager of the City Forge Co.; G. E. Ireland, vice-president; R. D. Mills, treasurer; LeRoy E. Eastman, secretary, and G. A. Strub, assistant general manager. These officers, excepting Strub, together with C. O. Miniger, F. H. Landwehr and H. E. Collin, form the directorate of the new company. The City Machine & Tool Co., and City Forge Co., will probably both soon be housed in a new plant.

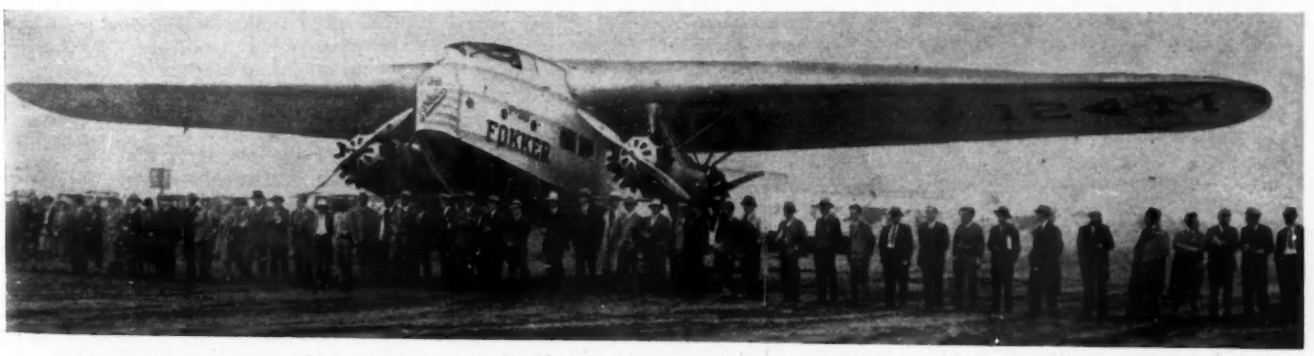
New Brennabor Models

BERLIN, Sept. 18 *(Special)*—The makers of the Brennabor cars have just announced the production of two new models. One is a small four-cylinder of 98 cu. in. the other a larger six-cylinder of 152 cu. in. displacement. Both models have a large number of parts in common. With closed bodies the smaller car is to be sold around $950 and the larger model at $1200. The design is straightforward with side by side valves but incorporates many interesting small features.

Uses Jaeger Clocks

DETROIT, Sept. 16—The new Cadillac and LaSalle models, announced recently in *Automotive Industries*, are equipped with Jaeger Swiss American clocks. This is the third season these lines have been equipped with these timepieces.

Thirty-Passenger Airplane Undergoes Tests



This is the first of five huge Fokker F-32 30-passenger airplanes which will be built under the direction of Anthony H. G. Fokker, designer. It was successfully tested at Teterboro Airport, N. J., recently

Tire Production Up, But Stocks Recede

Inventories Reported Down For July But Gain Over Last Year

NEW YORK, Sept. 17—Increased shipments of all types of tire casings and tubes during July resulted in decreased inventories throughout the industry as compared with the previous month, although production has been increased, according to estimates prepared by the Rubber Manufacturers Association.

Inventories are slightly higher than at the close of July a year ago, resulting entirely from decreased production.

These estimates are based on figures secured from what is believed to be 75 per cent of this country's production. Comparative figures follow:

	Inventory	Production	Shipments
PNEUMATIC CASINGS—ALL TYPES			
July 1929	11,872,330	4,856,241	5,891,020
June 1929	13,467,567	5,477,771	5,440,693
July 1928	8,388,358	4,873,716	5,924,156
INNER TUBES—ALL TYPES			
July 1929	12,248,982	4,634,251	6,084,421
June 1929	14,055,514	5,233,804	5,212,171
July 1928	11,230,601	5,005,216	6,546,482
BALLOON CASINGS			
July 1929	8,515,634	3,689,616	4,192,894
June 1929	9,471,532	4,223,335	3,829,506
July 1928	5,215,331	3,358,203	3,658,636
BALLOON INNER TUBES			
July 1929	8,692,058	3,249,014	3,945,727
June 1929	9,654,688	4,049,173	3,510,947
July 1928	6,794,803	3,240,455	3,576,465
HIGH PRESSURE CORD CASINGS			
July 1929	3,325,494	1,162,182	1,690,264
June 1929	3,956,799	1,249,596	1,594,201
July 1928	3,039,349	1,506,228	2,207,086
HIGH PRESSURE INNER TUBES			
July 1929	3,540,819	1,382,118	2,135,297
June 1929	4,384,077	1,177,147	1,698,896
July 1928	4,435,798	1,764,761	2,970,017

Guggenheim Safety Event Closes; 9 Entries Added

NEW YORK, Sept. 19—Harry F. Guggenheim, president of the Guggenheim Fund for the Promotion of Aeronautics, announced yesterday that the entry list of 25 in the $150,000 safe aircraft competition is complete with the exception of five applicants whose petitions are pending.

The contest will close on Oct. 31, and provides a first prize of $100,000 for the plane showing the greatest advance in aero-dynamic safety without loss of efficiency. The nine new entries are:

Gates Aircraft Corp., New York City; Taylor Brothers Aircraft Corp., Bradford, Pa.; Command-Aire, Inc., Little Rock, Ark.; Ford-Leigh Safety Wing, Inc., Jackson Heights, L. I.; Moth Aircraft Corp., Lowell, Mass.; John H. Wiggins Co., Inc., Tulsa, Okla.; V. J. Burnelli, Keyport, N. J.; Bourdon Aircraft Corp., Hillsgrove, R. I.; Whittelsey Manufacturing Co., Inc., Bridgeport, Conn.

Bleriot Predicts Faster Airplanes

PARIS, Sept. 13—The prediction that a speed of 750 miles an hour would be attained by airplanes in another ten years was made by Louis Bleriot, the first man to fly across the English Channel, in an interview which appeared in the Paris Midi.

Cadillac Plans Super-Car With Sixteen Cylinders

DETROIT, Sept. 18—President Lawrence P. Fisher of the Cadillac Motor Car Co. announced during the coming year the company will in all probability place on the market a 16-cylinder super motor car. This new car, according to Mr. Fisher, has been designed and developed by the same engineers who are responsible for the Cadillac and LaSalle eight-cylinder lines and will be an addition to these automobiles.

In this country every year there are sold some foreign cars as well as a limited number of domestic automobiles which have as their chief appeal exclusiveness, luxurious appointments and unusual performance. It is for this limited market that this super-car was designed, he said.

Mr. Fisher said that while present design and construction in motor cars has attained a degree of excellence supplying any real need, there are a few motorists willing to pay for the "ultra" regardless of price.

Cam Gears, Ltd., Producing Bishop Steering Units

LONDON, Sept. 18 (*Special*)—The British design of cam and lever steering which has been adopted by Morris for his two new six-cylinder cars and by several makers of buses and trucks, is made by Cam Gears, Ltd., of London, and is known as the Bishop steering gear. The cam unit has a constant pitch, which permits of castering, the self-centering effect being provided at the king-pins.

Budd Wheel to Issue Stock

PHILADELPHIA, Sept. 18—At a meeting of the board of directors today of the Budd Wheel Co., of this city and Detroit, it was decided to issue 22,504 additional shares of common stock and to offer common stockholders the right to subscribe for the additional stock at $50 per share in the ratio of one share of new stock for 10 shares of common.

De Vilbiss Has New Spray Gun

TOLEDO, Sept. 16—The DeVilbiss Co., makers of spray painting equipment, has developed a new spray gun for applying oil, washes or air to motor cars. It has an adjustable nozzle which permits it to be used in hitherto inaccessible places on a car.

Steel Sales Uneven But Prices Hold Up

Mills Face Shifting Capacity as Demand Continues to be Unsteady

NEW YORK, Sept. 19—Automotive buying of steel is a seesaw affair. With the shrinkage in mills' backlog, rate of operations is becoming more and more dependent upon the daily inflow of specifications, and these are in good volume one day and disappointing the next.

Sheet demand is somewhat better maintained than that for most other descriptions of finished steel. Strip mills manage to keep about two-thirds of their capacity engaged. Demand for hot-rolled and cold-finished steel bars is light, as is that for automotive alloy steels.

Usually conditions like those which confront the steel industry at this time lead to price-shading by mills that are eager to keep their wheels turning at a slightly better rate than the general run of their competitors. So far, however, there has been surprisingly little of this sort of price-whittling.

Aluminum—Fabricating subsidiaries of the leading interests are reported to be working at capacity, especially so on pistons. Importers have more inquiries regarding fourth quarter shipments. Better interest on the part of buyers is also reported by secondary metal dealers and remelters. The market is quotably unchanged.

Copper—Labor disturbances at one of the New Jersey electrolytic refineries are responsible for a dent in production of 5000 tons so far. The market is quiet and unchanged. Brass ingot manufacturers who raised their prices when the copper market looked as though it might advance have revised their quotations downward.

Tin—Following protracted dullness, the market is showing more signs of activity, with prices fractionally higher and the general feeling more confident.

Lead—The market is rather dull, but fairly steady.

Hudson Foreign Sales Under C.I.T. Contract

DETROIT, Sept. 16—The Hudson Motor Car Co. announces the completion of an arrangement with Commercial Investment Trust for the financing of sales of Hudson and Essex cars and Dover commercial cars in the chief export markets of the world. The volume expected annually by C. I. T. under the contract is about $20,000,000.

Hupp Postpones Meeting

DETROIT, Sept. 18—The Hupp Motor Car Corp. will hold its annual election of officers on Sept. 24 at Cleveland. This is a postponement of the scheduled meeting for Sept. 17 at Detroit.

Stock Date Is Changed

NEW YORK, Sept. 16—Studebaker Corp. has extended the date for the closing of the offer to exchange its stock for Pierce-Arrow Class A to Dec. 12.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES.

NEW YORK, Sept. 19—With the breaking up of the recent hot weather, trade last week was on a larger scale. The opening of the schools after the summer vacation greatly stimulated retail trade in most clothing lines. Some of the lighter industries have been showing greater activity; and while operations in the steel mills have slackened somewhat, they are still above last year's levels.

RETAIL STORE SALES

Sales of 34 leading store chains during August amounted to $188,697,082, showing an increase of $46,105,284, or 32.33 per cent over those in the corresponding month last year. Sales of these same store chains during the first eight months of the year were 28.10 per cent above those in the corresponding period last year.

FREIGHT LOADINGS

Railway freight loadings for the week ended Aug. 31 totaled 1,160,210 cars, the highest for any week so far this year, which marks an increase of 43,499 cars over those in the corresponding week last year and an increase of 42,850 cars over those in the corresponding week two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Sept. 14 stood at 96.3, as compared with 96.3 a week earlier and 96.9 two weeks earlier.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Sept. 11 were 9 per cent above those in the corresponding week last year.

STOCK MARKET

Liquidation on the stock market during every session last week precipitated a severe decline. The nervousness of traders over the mounting level of brokers' loans and consistent bear pressure caused many stocks to close the week with net losses. Call money ranged from 7 to 10 per cent.

BROKERS' LOANS

Brokers' loans in New York City for the week ended Sept. 11 increased $120,000,000, bringing the total on Sept. 11 up to $6,474,000,000, as against only $4,385,000,000 a year earlier.

Plan Aero Development

ATLANTIC CITY, N. J., Sept. 16—Sale of the Atlantic City Motor Speedway, at Amatol, N. J., scene of scores of famous races and automobile tests, to the General Aero Corp. of America, 60 Wall Street, New York, was announced last night by Joseph Thorp, general manager of the speedway. The tract includes 500 acres. Work will be started at once, Mr. Thorp said, on clearing additional ground about the track and grandstand for the building of runways in preparation for the development of one of the largest airports in the country. Colonel Clarence D. Chamberlin, trans-Atlantic pilot, is chairman of the Technical Committee and consulting aeronautical engineer to the corporation.

Thompson Leases Pontiac Site for Air Development

DETROIT, Sept. 16—The Thompson Aeronautical Corp. of Detroit and Cleveland this week obtained permission from the city of Pontiac, Mich., to lease for a 10-year period a site on the municipal airport on which it will spend $70,000 for administration offices and a hangar. Equipment costing $30,000 is to be placed in the building.

The Thompson company will service not only its own mail and passenger carrying planes at Pontiac, but also will service all Wright engine planes in the district comprising Michigan and Indiana, it is announced. It is planned to take bids within the next four or five days, and it is hoped by the Thompson company that work on the building can be started by Oct. 1.

Nash Outlines Production

MILWAUKEE, Sept. 16—C. W. Nash, president of Nash Motors Co., Kenosha, Wis., predicted that high production in all Nash plants would be resumed early in October. He said, "We hope that by early October the Milwaukee Nash plant will be running at full speed. Our program here at that time calls for 200 cars a day and a full complement of men. We also hope to see the Seaman body plant operating at top speed by the same time." Mr. Nash was reticent about discussing production plans, saying that all details pertaining to the new models have not been completed.

August Employment Shows Unusual Drop

Recession for Month First in Nearly Two Years, Government Finds

WASHINGTON, Sept. 12—While employment in the automotive industry showed seasonal recession during the month of July, the level of employment was unusually high when compared with former years, according to the monthly report of the U. S. Employment Service, Department of Labor, based upon a nation-wide survey of employment conditions and made public this week. In August, however, for the first time in 21 months, the industry showed a falling-off in employment, as compared with the same month of the preceding year.

Reports covering the automotive and allied industries from the principal automobile manufacturing states are summarized as follows:

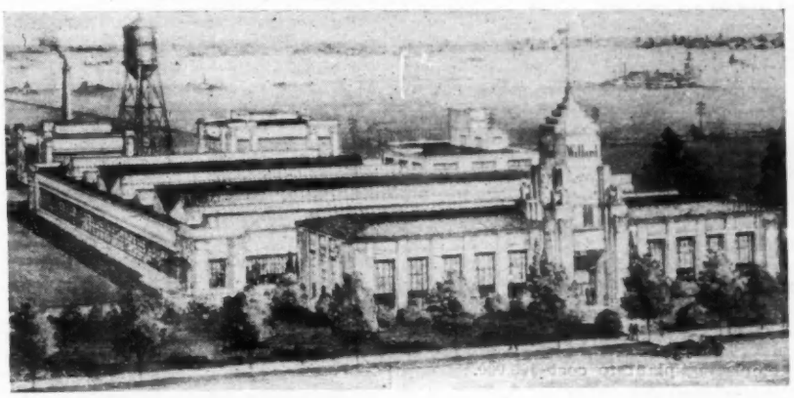
NEW YORK: General—Slight curtailment in several automobile factories; Buffalo—Seasonal let-up in automobile industry; airplane factories busy; Syracuse—Plants manufacturing automobiles and gears worked overtime; Yonkers—Auto plants worked full schedules; Elmira—Fire engine plant operated slightly cut schedule.

NEW JERSEY: General—Airplane and rubber plants on satisfactory schedules; Trenton—Rubber plant operated 75 per cent capacity.

PENNSYLVANIA: General—Automobile accessory, assembling and body building plants operated at high level; Philadelphia—Body building factories increased forces.

MICHIGAN: General—Seasonal curtailment in automobile industry; Detroit—Summer recession apparent but level of employment higher than usual; Grand Rapids—Body manufacturing plants kept full forces employed; Flint—Automobile factory adding metal stamping unit; Lansing—Automobile plant operated part time schedule; Jackson—Slight curtailment.

Willard Begins $1,000,000 Plant



Excavation work for this $1,000,000 plant for the Willard Storage Battery Co. has been started at Los Angeles. Construction of the plant will be rushed with the expectation of starting actual production operations by Oct. 31. The new plant will have an initial yearly output of approximately $3,000,000 in value, will employ approximately 250 persons and will be equipped with the latest labor-saving machinery, according to C. H. Starr, general manager

Plant Expenditures Await Tool Exhibit

Additions Contemplated By Automotive Concerns Need Equipment

PHILADELPHIA, Sept. 19—Announcement of more than 260 displays of machine tools, over 100 of which will be of new models, at second national exposition of the National Machine Tool Builders Association which will take place in Cleveland from Sept. 30 to Oct. 4, has retarded buying of new equipment on the part of the automotive industry.

Construction is contemplated, however, in almost every section of the country. Most of the proposed expenditures are for additions to present manufacturing and assembly units.

The following are some of the projects planned or under way:

Boston—Curtis Flying Service, Inc., Boston, filed plans for hangar with shop to cost $65,000 with equipment.

New York—C. B. Meyers, 31 Union Sq., architect, asking bids on automobile service, repair shop and garage to cost $170,000 with equipment.

Long Island City, N. Y.—Moto Meter Gage & Equipment Co. beginning additional buildings for recently acquired plant of National Gauge & Equipment Co., La Crosse; will remodel existing structure.

Buffalo—Trico Products Corp., windshield wipers, etc., plans plant at Bridgeburg, Ont., to cost $55,000 with equipment.

Syracuse, N. Y.—Bresee Chevrolet Co. plans for service, repair and garage to cost $180,000 with equipment. M. J. DeAngelis, Rochester, is architect.

Philadelphia—Gulf Refining Co. awarded contract to Cramp & Co., for buildings to cost $100,000 with equipment. Edward B. Lee, Pittsburgh, architect.

Farman Aircraft Corp. (N. S. Ludington) awarded contract to Airport Development & Construction Co. for 3-story plant at Camden, N. J., for parts and assembling, to cost $100,000 with equipment.

William M. Stanton, architect, plans 5-story service and repair garage at Atlantic City, N. J., to cost $200,000 with equipment.

Harrisburg, Pa.—Capital Landing Field Co. (Frank A. Robbins, Jr.) plans airport near city, including hangar, shops, oil storage, etc., to cost $100,000 with equipment.

Pittsburgh—Airways & Aircraft Co. plans airport development at Dravosburg, Pa., including hangars, etc., to cost $85,000 with equipment. Kenneth Franzheim, 345 Madison Ave., New York, architect.

Cleveland—Eaton Axle & Spring Co. awarded contract to H. K. Building Co., for assembling unit to cost $70,000 with equipment. George S. Rider Co., architect and engineer.

John Harsch Bronze & Foundry Co. contemplating plant to cost $65,000.

Akron—Firestone Tire & Rubber Co. plans 3-story factory branch at Baltimore, to cost $200,000 with equipment.

Dayton, Ohio—Inland Mfg. Co., automobile equipment and accessories, awarded contract to Hillsmith Co., Dayton, for addition to cost $500,000 with equipment.

Gartland, Hoswell & Rentschler Foundry Co., awarded contract to H. R. Bragg Co., for extensions and improvements to cost $23,000.

Terre Haute, Ind.—City Airport Commission arranging bond issue of $125,000 for municipal airport at Dresser field. Plans will be drawn for hangars, repair shops, oil storage, etc.

Fort Wayne, Ind.—Tokheim Oil Tank & Pump Co., gasoline pumps and equipment, awarded contract to Rump-Kintz Co., for addition to cost $100,000 with equipment. Pohlmeyer & Pohlmeyer, architects.

Detroit—Midland Steel Products Co. awarded contract to Wisconsin Bridge & Iron Co., for addition for storage and distribution, to cost $60,000. Company plans to increase output of 4-wheel brakes. Main offices, Cleveland.

Pontiac, Mich.—Hancock Iron Works, Inc., asked bids for 1-story plant to cost $40,000 with equipment. Robert O. Derrick, Inc., Detroit, is architect.

Buchanan, Mich.— Clark Equipment Co., automotive parts and equipment, has secured additional interest in Frost Gear & Forge Co., Jackson, Mich. Expansion planned, including addition at Buchanan to cost $50,000. Plans by F. L. Shoemaker, Sturgis, Mich., architect.

Eau Claire, Wis.—Northwestern Motor Co., let contract for foundry addition to Olson & Walker Co.

Marinette, Wis.—E. P. Olsen Machine & Tool Works will add equipment to manufacture electric heater for warming crankcases.

Oshkosh, Wis.—Wisconsin Axle Co. starting erection of addition to machine shop.

Milwaukee—Heil Co., automobile bodies, closed bids on a group of plant units to be erected at Cambridge, Mass.

Houston, Tex.—Tidal Refining Co. (Tide Water Oil Co., New York) plans oil refinery on 700-acre tract at Ingleside, to cost $2,000,000 with machinery. Edward Ellsberg, chief engineer.

Singer is Producing Lowest-Priced Six in England, Challenging New Morris Line

LONDON, Sept. 18 (*Special*)—The Singer Motor Co., which has the largest output in England excepting Morris and Austin, has introduced a new six-cylinder, a direct challenge to the new Morris Six announced recently. Like the Morris, it has a side valve engine with coil ignition, though the piston displacement is 107 cu. in. as compared with the Morris 122 cu. in. but its prices are lower and at £240 for the roadster it is the lowest priced six-cylinder car yet produced in England.

The phaeton is £250 (Morris £275) and the metal sedan £275 (Morris £299, or £275 for the fabric sedan). Only the 12 hp. Armstrong-Siddeley Six (97 cu. in.), which has a shorter wheelbase, narrower track and smaller bodies, is as low priced as the new Singer phaeton and sedan. A four-passenger sports coupe, or two-door sedan, is also offered at £270, and differs from other British cars of this type in having a metal instead of a fabric body.

The engine has a four-bearing crankshaft, aluminum pistons, pressure lubrication throughout, battery ignition with automatic timing and thermo-syphon water circulation. The transmission comprises a single-plate clutch, three-speed gearset with central control, open propeller shaft with metallic joints and spiral bevel drive with a ratio of 5.22. The first and second ratios are 17.15 and 9.89 respectively.

Brakes have direct mechanical operation. Tires are reinforced 29 x 5 in. Dunlops on wire wheels. Springs are half-elliptic with Newton hydraulic shock absorbers; steering is by screw and nut and chrome plating is used for external parts; leather upholstery, bumpers and Triplex glass are standard equipment.

The sedan has four doors and six lights and owing to the low build of the chassis, a man of average height can see over the roof; nevertheless there is plenty of headroom.

The maximum speed is said to be 60 m.p.h. and the fuel consumption 25 miles per gallon. Deliveries are to commence immediately.

Chrysler Addresses Dodge Men on First Anniversary

DETROIT, Sept. 13—"The Restoration of Dodge Brothers Prestige" was the subject of an earnest talk by Walter P. Chrysler to the executives of the Dodge Brothers organization on the first anniversary of Chrysler ownership of the Dodge properties. He said that under the management of the Chrysler organization, the Dodge Brothers Six has shown a gain in sales 57 per cent greater than that of the former Victory Six in the year before Chrysler acquired Dodge. The increase in Dodge Brothers truck, bus and coach business for the same period has also been substantial.

Mr. Chrysler said that plant efficiency has been greatly increased under the direction of K. T. Keller, vice-president in charge of all Chrysler Motors manufacturing and general manager of Dodge Brothers. Much of this growth Mr. Chrysler attributes to the restoration of the policies established in the business 15 years ago by John and Horace Dodge, and to the reestablishment of the name of Dodge Brothers in the motor car markets of the world.

German Fords Exceed 10,000

BERLIN, Sept. 17 (*Special*) — On Sept. 3, the Berlin Ford factory celebrated the production of the 10,000th Ford Model A car. The German Ford Co. is satisfied with the sales and is at present negotiating for the purchase of a larger factory.

Buick Maintaining Peak Production

FLINT, MICH., Sept. 14—Peak production is being maintained at the Buick Motor Co. plants here, E. T. Strong, president, announced today.

Financial Notes

Brockway Motor Truck Corp. and **Indiana Truck Corp.** report consolidated net profits after all charges for the six months ended June 30 of $548,541. This is equivalent after preferred dividends to $2.41 a share on common stock and compares with $776,326, or $3.73 a share, for the first six months of 1928.

Checker Cab Mfg. Corp. and subsidiaries report net income after all charges for the first seven months of the current year of $2,864,276. This is equivalent to $7.64 a share on outstanding no par common stock.

Willys-Overland Co. declared the regular quarterly dividend of $1.75 a share on the 7% preferred stock. The dividend payment totals $278,185.25 on the 158,963 shares of outstanding preferred, payable Oct. 1 to stockholders of record Sept. 16.

Thompson Products, Inc., had net earnings, after all charges, including Federal income taxes, for the seven months ended July 31, 1928, of $1,033,768, equivalent, after dividend requirements on preferred stock, to $3.87 per share on 262,660 shares of combined Class A and Class B stock outstanding.

General Tire & Rubber Co., Akron, closed the third quarter with sales at the highest point of the year. While August was company's peak month for sales in 1928, sales in August, this year, have been 20% greater than for that month last year. Sales for the first three quarters have shown an increase of a little less than 10% over the same period of 1928.

Indian Motocycle Co. reports net loss for the first half of the current year of $378,201 after all charges. This compares with a net profit for the corresponding period of last year, including $35,183 for the sale of Wire Wheel Corp. stock, of $105,643.

Singer Motor Co., London (Eng.), announced a dividend of 12½% on the common stock, plus a 5% bonus. Reports of a merger with other British companies were denied. Dividends are being paid on the increase of capital since last year, due to increase of surplus and reserves, from £666,760 to £999,933. Introduction of a new light six, which would be the lowest priced British six-cylinder car yet produced, was announced.

Pratt & Lambert, Inc., has declared a dividend of one dollar a share on the no par value common stock, to be paid October 1st to stock of record September 16.

Packard Motor Car Co. declared two dividends of 15 cents each, payable October 31 and December 30 to stock of record October 11 and December 12, respectively. These dividends cover the period from the close of the old fiscal year, ended August 31, to the start of the new fiscal year, beginning January 1. After the first of the year it is expected dividends will be paid on a regular quarterly basis.

General Instruments Co., a new corporation, organized by Vincent Bendix, will soon offer a public offering of stock units at about $22.50 each, each unit consisting of one share of Class A stock and one share of Class B stock. Class A stock, of $20 par value, will pay a dividend of $1.50 annually and will be convertible into Class B stock.

Electric Autolite Co. has declared regular quarterly dividend of $1.50 on common, $1.75 on preferred and an extra dividend of 50c, all payable October 1 to stockholders of record September 24.

Hercules Motors Co. has declared an initial quarterly dividend of 45 cents payable October 1 to stockholders of record September 20.

McCord Radiator & Mfg. Co. has declared regular quarterly dividend of 75 cents on Class A stock payable October 1 to stockholders of record September 23.

La Crosse Plow Co. stockholders, La-Crosse, Wis., have approved sale of the business to the Allis-Chalmers Mfg. Co., Milwaukee, and merger of interests will be completed at the special meeting of Allis-Chalmers stockholders on Sept. 20.

Suggest Disposal Plan for Old Cars

Ford and Queens Engineers Work on Salvage Plant for City

NEW YORK, Sept. 17 — Tentative specifications for a reduction plant, in which metal parts of abandoned automobiles would be salvaged, are being prepared in Queens as the result of a series of conferences between Albert H. Dousman, engineer of the Ford Motor Co. plant at Kearney, N. J., and Major Oscar Erlandsen, chief engineer of the borough.

The problem of disposing of the large number of cars, particularly old Fords, which are abandoned in Queens, caused Borough President Harvey to write several weeks ago to Henry Ford asking his advice regarding the best method for getting rid of these hulks. Mr. Ford requested Mr. Dousman to go to Queens and confer with the borough president and his engineers.

It was finally decided to draw up plans for a reduction plant which would be equipped with machinery to separate the metal worth salvaging from the waste material. Under this plan the metal would be pressed into bales and sold.

In writing to Mr. Ford to tell him of the results of the conferences Mr. Harvey said: "Whether the city of New York will set up this plant or whether an independent salvage corporation will be given a franchise to do the work has not been decided. But in either case a certain income should be realized through the disposal of abandoned cars; this income to be used by the city of New York to defray at least part of the expense entailed in the collection of automobile hulks from the streets and highways."

John J. Halleran, commissioner of public works in Queens, said that several salvage corporations have applied for the franchise to salvage the abandoned cars. These proposals are being turned over to Mr. Dousman and Major Erlandsen.

Many individuals have submitted plans for disposing of these cars.

Develops New Airplane

NEW YORK, Sept. 16—Curtiss Aeroplane and Motor Co. has developed a new mail airplane known as Carrier Pigeon 11, which is capable of transporting heavier loads at higher speeds than any other plane so far tested and flown. This plane is to be presented to operating companies holding air mail contracts and to the public when it takes off on Oct. 5 as one of the Curtiss entries in the Fifth National Air Tour for the Edsel B. Ford Reliability Trophy. This plane is a biplane of single bay construction. It is powered with a Curtiss Conqueror GV-1570 water cooled 600 hp. engine.

Offers "Atmosphere Course"

LOS ANGELES, Sept. 16—Planned to be of special interest and value to the aviator, both prospective and experienced, a new college course in Physics of the Atmosphere is to be given this fall at the University of Southern California, according to announcement of Professor Arthur Nye, head of the Department of Physics.

Rail Bureau Governs Chinese Roads

WASHINGTON, Sept. 17 — China has enacted a national law placing highways administration under the Ministry of Railways with boards of construction having jurisdiction over provincial highways, according to a cable received at the Commerce Department this week from Shanghai. Each provincial board of construction is required to carry a supply of motor car parts to facilitate servicing.

Plan Complete Line of Bodies

ROCKFORD, ILL., Sept. 18 — The Emerson-Brantingham Corp. are making changes in the Batavia, Ill., plant for the production of a complete line of commercial bodies for leading truck manufacturers.

U. S. Recommends Highway Marking

WASHINGTON, Sept. 18—The aeronautics branch of the Department of Commerce last week announced that it is making an effort to obtain the marking of highways for air navigation. Highways are the pilots' best landmarks, the bureau announced, stating that if official route numbers are painted on the highways, pilots will find them very useful in finding their way through the airlanes.

Postal Receipts Gain

WASHINGTON, Sept. 17—Business conditions throughout the United States during the month of August are reflected in the 5.62 per cent increase in postal receipts at 50 industrial cities.

Unusual Tests Are Given to British Air Liners

LONDON, Sept. 18 (*Special*)—One of the new 20-passenger three-engined Armstrong-Siddeley Argosy, recently delivered to the British Imperial Airways for the London-India route, was subjected to an unusual test. The airplane was loaded to its full capacity of 5000 lb., with sufficient gasoline for 4 hours' flight.

After leaving the ground in 11 seconds and climbing to between 2000 and 3000 ft., each engine in turn was switched off and the machine flown for 10 minutes with the two remaining power units.

Under these conditions, a height of over 2000 ft. was maintained with any one engine stopped while flying at an air speed of 75-80 m.p.h. When engines were switched off, the propeller continued to turn it at a very low speed and after 5 minutes it stopped. To start the engine again the machine had to be speeded up at about 100 m.p.h. by diving slightly.

Testing Rockets as Catapults

BERLIN, Sept. 16 (*Special*)—The Junkers interests are carrying on in secrecy tests with rockets fastened to the wings of standard airplanes for the purpose of rapidly increasing starting speed and enabling heavily loaded ships to get into the air more quickly. Three rockets are attached to each wing. The rocket casings have a diameter of 4 in. Tests on a waterplane with floats proved unsatisfactory. Much smoke was developed and the actual effect was not as expected. Further experiments are being carried out and it is hoped to develop this means of acceleration to practical usefulness.

White Breaks Bus Record

CLEVELAND, Sept. 15—The White Motor Car Co. delivered 155 buses during August, setting a new record for passenger vehicle delivery. The previous high mark was in July, when 135 buses were delivered.

Sky Patrol is Idea of New York Police

NEW YORK, Sept. 19—Police Commissioner Whalen announced that he had taken steps toward regulating air traffic over the crowded areas in and about the city. He said he had included in his budget a request for an appropriation to establish a small flying school for policemen, the purchase of suitable aircraft and the establishment of a department within the Police Department to regulate air traffic over the city.

He also requested that some ordinance be passed to curb low and dangerous flying in all places under city jurisdiction. To enforce such ordinances, he said, the new branch of the Police Department will be needed.

Peerless Announces Prices

CLEVELAND, Sept. 15 — Peerless Motor Car Corp. has announced its first car priced under $1,000. It is the new 66 roadster, one of the four models of the series. Prices follow:

Roadster	$ 995
Coupe	1,095
Victoria	1,145
Sedan, 6-pass.	1,195

U. S. Orders 70 Consolidated Airplanes

NEW YORK, Sept. 16—Consolidated Aircraft Corp. has been awarded a contract to supply the United States Army with 70 all-metal corps observation planes of the Thomas Morse type. The order includes separate parts in a quantity sufficient to bring the total up to the equivalent of 87½ planes.

Estimates Safety Glass Equipment

NEW YORK, Sept. 17—By the end of this year 4,500,000 cars will have been equipped with non-shatterable glass in the opinion of the Triplex Safety Glass Co. of North America, which bases this on current production estimates of automobile manufacturers.

Autogiros to Enter Tour, Ford Contest Head Says

NEW YORK, Sept. 15—Three autogiro "windmill" airplanes, one of them piloted by Juan de la Cierva, the inventor, have been entered among 40 airplanes which will fly for the Edsel B. Ford trophy in the 1929 national air tour, starting Oct. 5 from the Ford Airport and swinging around the East and Middle West to finish the evening of Oct. 21.

A number of noted pilots will be in this fifth annual reliability test, it was announced today by Capt. Ray Collins, tour manager. Only 16 pilots have been named so far. The mileage to be traversed, with two stops daily, will be approximately 4850. The contestants will swing northeast to Montreal and Portland, then south to Jacksonville, Fla., stopping in New York, Tuesday, Oct. 8, and will go on immediately to Philadelphia. After a Sunday rest at Atlanta, the planes will swing west to Wichita, Kan.

Rumanians Accept Ford Offer

BUCHAREST, Sept. 18—The Rumanian Government has accepted the proposal of a representative of Henry Ford to build an assembling plant near Constantza and has granted territory in the free zone of the harbor. Eight hundred workers will be employed in the plant, which will furnish cars for the entire Balkans.

Du Pont Plant to be Begun

WILMINGTON, DEL., Sept. 16—The Du Pont Viscoloid Co. will soon begin construction of an addition to its Leominster (Mass.) plant, for the manufacture of transparent Pyralin sheeting for use in safety glass. New buildings will be constructed and equipped with specially designed modern machinery for the production of the superior quality required by the safety glass industry.

The additional installation, which is estimated to cost approximately $1,000,000, will be completed in the summer of 1930.

Calendar of Coming Events

SHOWS

National Machine Tool Builders' Exposition and Congress, Cleveland, Sept. 30-Oct. 4
Paris, Automobiles ..... Oct. 3-13
London, Automobiles ..... Oct. 17-26
Prague, Automobiles ..... Oct. 23-30
Paris, Motorcycles ..... Oct. 23-Nov. 3
M.&E.A. Show and Convention, Chicago ..... Nov. 4-9
N.S.P.A. Show and Convention, Detroit ..... Nov. 11-16
Berlin Auto Salon ..... Nov. 14
London, Trucks ..... Nov. 7-16
Paris, Trucks ..... Nov. 14-24
London, Motorcycles ..... Nov. 30-Dec. 7
Brussels Auto Salon ..... Dec. 7
New York National ..... Jan. 4-11
Newark (N. J.) Automobile Show. Jan. 11-18
Boston Automobile Show ..... Jan. 13-25
Chicago National, Coliseum .. Jan 25-Feb. 1
Cleveland Automobile Show .. Jan. 25-Feb. 1

CONVENTIONS

American Drop Forging Institute, Shawnee-on-Delaware ..... Sept. 25-27
American Electric Railway Association, Atlantic City ..... Sept. 28-Oct. 4
National Industrial Advertisers Assn., Cincinnati ..... Sept. 30-Oct. 2
National Safety Congress, Annual, Chicago ..... Sept. 30-Oct. 4
Penna. Automotive Association, Erie, Pa. ..... Oct. 7-8
Permanent International Association of Road Congresses, Sixth Session, Washington, D. C. ..... Oct. 7-11
Associated Business Papers, Chicago, Oct. 21-22
Society of Industrial Engineers, Detroit ..... Oct. 16-18
National Hardware Association, Atlantic City ..... Oct. 21-24
Society of Industrial Engineers, Sixteenth Annual Meeting, Hotel Statler, Cleveland ..... Oct. 23-25
National Battery Mfrs. Assn., Hollenden Hotel, Cleveland ..... Oct. 24-25
Amer. Gear Mfrs. Asso., Phila. .. Oct. 24-26
World Engineering Congress, Tokio, Japan ..... Oct. 29-Nov. 22
National Automotive Parts Association, Detroit ..... Nov. 6-8
Highway Research Board, Ninth Annual Meeting, Washington, D. C. Dec. 12-13
National Automobile Dealers Association, New York City ..... Jan. 6
American Roadbuilders Association, Atlantic City ..... Jan. 11-18
National Automotive Dealers Association, Chicago .. .. Jan. 27-28
Southwest Road Show and School, Wichita ..... Feb. 25-28

RACES

Edsel B. Ford Air Tour, Dearborn, Mich. ..... Oct. 5-21
Los Angeles ..... Nov. 17

S. A. E.

Production Meeting, Cleveland ..... Oct. 2-4
Transportation Meeting, Toronto. Nov. 12-15
Annual Meeting, Detroit ..... Jan. 21-24

SALONS

Hotel Drake, Chicago ..... Nov. 9-16
Hotel Commodore, New York City. Dec. 1-7
Hotel Biltmore, Los Angeles ..... Feb. 8-15
Palace Hotel, San Francisco, Feb. 22-Mar. 1